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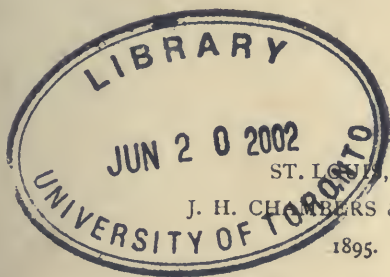


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INDEX TO VOL. XII.

AUTHORS.

ORIGINAL ARTICLES.

ALT, A.,	-	-	-	-	II, 33; III, 65; VI, 165; VI, 167; IX, 257, XII, 355
AYRES, S. C.,	-	-	-	-	X, 289; XI, 321
BEARD, CH. H.,	-	-	-	-	IV, 97
CULBERTSON, L. R.,	-	-	-	-	VII, 199
DOMBROWSKI, P.,	-	-	-	-	VIII, 225
JENNINGS, J. E.,	-	-	-	-	VII, 204
JOHNSON, W. B.,	-	-	-	-	VII, 193
POOLEY, T. R.,	-	-	-	-	V, 129
PRENTICE, CH. H.,	-	-	-	-	I, 1
RAY, D.,	-	-	-	-	VI, 161

SELECTIONS FROM MEDICAL JOURNALS.

BOOTH, J. A.,	-	-	-	-	-	-	-	-	X, 310
BRUNER, W. E.,	-	-	-	-	-	-	-	-	VI, 186
BULL, CH. S.,	-	-	-	-	-	-	-	-	II, 60; IX, 279
BURNETT, S. M.,	-	-	-	-	-	-	-	-	VIII, 243
CONNER, L.,	-	-	-	-	-	-	-	-	VII, 215
CULBERTSON, L. R.,	-	-	-	-	-	-	-	-	II, 46
DE SCHWEINITZ, G. E.,	-	-	-	-	-	-	-	-	III, 78
DUNN, J.,	-	-	-	-	-	-	-	-	II, 53
GARRISON, H. E.,	-	-	-	-	-	-	-	-	IV, 120
GOULD, G. M.,	-	-	-	-	-	-	-	-	III, 94
HANSELL, H. F.,	-	-	-	-	-	-	-	-	IV, 125
HOBBS, A. G.,	-	-	-	-	-	-	-	-	I, 31
JACKSON, E.,	-	-	-	-	-	-	-	-	III, 86

SOCIETY PROCEEDINGS AND NOTICES.

American Medical Association, - - - - -	V, 145
British Medical Association, - - - - -	X, 272; XI, 332, XII, 358
Chicago Ophthalmological and Otological Society, - - - - -	III, 74
New York Academy of Medicine. - - - - -	II, 41; VII, 208
New York Neurological Society, - - - - -	III, 76
Ophthalmological Society of the United Kingdom, - - - - -	I, 19; IV, 114; VI, 169 VIII, 238; XI, 239; XII, 377

SUBJECTS OF THE ORIGINAL ARTICLES.

Practical execution of ophthalmic prescriptions involving prisms, -	I, 1
Siderosis conjunctivæ and peculiar growth of conjunctiva, - -	II, 33
Experiences with a new anonymous local anæsthetic, - - -	III, 65
Squint and its surgery, - - - - -	IV, 97
Diseases of the eye dependent on grippe, - - - - -	V, 129
Congenital fistulæ of lachrymal sac; - - - - -	VI, 161
Experiences in removing lens in high-grade myopia, - - -	VI, 165
Paresis of oculomotor with acute pneumonia, - - - - -	VI, 167
Transplantation of skin in plastic operations on eyelids, - - -	VII, 193
Case of mind-blindness with auto-word-blindness, - - - -	VII, 199
Congenital rhabdo-myoma of orbit, - - - - -	VII, 204
Primary carcinom a of sphenoid sinus, - - - - -	VIII, 225
Neuritis optica from nasal treatment, - - - - -	IX, 257
Dermoid tumors of conjunctiva, - - - - -	X, 289
Lymphangioma cavernosum of orbit, - - - - -	XI, 321
Congenital tumor consisting chiefly of muscular and nerve-tissue, -	XII, 355

SUBJECTS OF TRANSLATED AND SELECTED
ARTICLES.

Scopolamine hydrobromate, - - - - -	I, 30
Paresis of abducens and pneumonia, - - - - -	II, 37

Tattooing the cornea to improve visual acuity, - - - - -	II, 39
Cortical lesion of right leg, shoulder and visual center, - - - - -	II, 46
Hæmorrhagic glaucoma, - - - - -	II, 53
Experiences in treatment of detached retina, - - - - -	II, 60
Sodium salicylate in exophthalmic goitre, - - - - -	III, 71
Epiphora, - - - - -	III, 78
Syphilis of the eye, - - - - -	III, 83
Growth of Ophthalmology and the eye in modern requirements, - - - - -	III, 86
Eye-strain and nocturnal enuresis, - - - - -	III, 94
Exophthalmos in an infant of three months, - - - - -	IV, 120
Monocular retinal hæmorrhages, - - - - -	IV, 125
Erosions of ulcers of the cornea and their treatment, - - - - -	V, 142
Two successful cataract extractions on a dog, - - - - -	VI, 174
Accidental sponge-grafting on the conjunctiva, - - - - -	VI, 181
Paralysis of superior recti, - - - - -	VI, 186
Skin-Grafting for epithelioma of lid, - - - - -	VI, 191
Strabismus as a symptom, causes and management, - - - - -	VII, 215
Exceptional features in cataract extraction, - - - - -	VIII, 243
Simple method of treating purulent conjunctivitis of infants, - - - - -	VIII, 251
Ephedrin—Homatropine, - - - - -	VIII, 253
Pathogenesis of sympathetic ophthalmia, - - - - -	IX, 262
Result of operation in 612 cases of convergent squint, - - - - -	IX, 279
Hysterical amblyopia and amaurosis treated by hypnotism, - - - - -	X, 310
Case of muscular detachment of retina with reattachment and recovery, - - - - -	XII, 382

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OPHTHALMOLOGY.

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No. 1.

ORIGINAL ARTICLES.

ON THE PRACTICAL EXECUTION OF OPHTHALMIC PRESCRIPTIONS INVOLVING PRISMS.

BY CHAS. F. PRENTICE, NEW YORK.

It is intended here to point out some instances in which lenticular decentration may be taken advantage of in the execution of prescriptions involving a combination of prisms with spherical and cylindrical lenses, in a manner to insure absolute accuracy, with least inconvenience of measurement and minimum expense of production. Within the past few years the practical value of the prism-diopter, as a unit (1Δ)¹ of prismatic power, has been appreciated to such an extent that the American Optical Company of Southbridge, Mass., and the Bausch & Lomb Optical Company, of Rochester, N. Y., have entirely discarded the old system of numbering prisms, in degrees, having now supplanted it by the prism-diopter for their entire "output." The prism-diopter is therefore no longer a subject for theoretical discussion, but one for practical consideration, having been indorsed in its underlying principle by both the

¹Concerning this exponent (Δ) see papers by Dr. Swan M. Burnett in *Annals of Ophthalmology and Otology*, July, 1894, *Transactions International Ophthalmological Congress*, Edinburgh, 1894, and *the Retractionist*, December, 1894.

American Ophthalmological Society and American Medical Association, and two of the most progressive and largest manufacturing establishments in the world. It may be of interest to note that the gross productions of these firms amounted to over \$2,000,000 in 1892. Such practical support certainly portends an enduring future of the prism-diopter, about which so much *pro and con* has been written since its first appearance in ophthalmic literature.² In this paper it will be taken for granted that the reader is at least familiar with the principles of the prism-diopter, so that only the relation which exists between it and the lens-diopter will here be repeated, to-wit:

A LENS WHICH IS DECENTERED ONE CENTIMETER WILL PRODUCE AS MANY PRISM-DIOPTERS AS THE LENS HAS DIOPTERS OF REFRACTION.

A knowledge of this law will frequently enable the oculist to change the form of his prescription so that it may safely be entrusted for execution to any optician capable of locating the optical center of a lens, and who is provided with no other instrument of measure than a pocket centimeter scale.

As the optician, generally speaking, is not allowed to exercise his own judgment in transforming prescriptions, it is necessary that the oculist's instructions be explicit respecting the proper method of putting his prescription into the best practical form. A few examples will serve to illustrate the method of applying the law of decentration.

PRESCRIPTION NO. 1.

O. D. + 3 D. sph. \ominus 1 Δ base out.

O. S. + 3 D. sph. \ominus 1 Δ base out.

The usual practice would be to grind + 3 sph. upon a prism of 1 Δ , so that a plano-convex element of 3 D. is substi-

²A Metric, System of Numbering and Measuring Prisms by Chas. F. Prentice, Archives of Ophthalmology, 1890 and 1891, AMERICAN JOURNAL OF OPHTHALMOLOGY, 1891.

tuted for the bi-convex lens used in the trial frame. In another paper, about to be published in the *Ophthalmic Record*, attention is called to the disadvantages of this procedure, where high degrees of curvature are concerned.

In the above example the ordinary method is objectionable, chiefly on account of the increased cost. The prescription shows that the prism-diopters required are few compared to the lens-diopters, so that the law of decentration becomes available. In accordance with this law, 3 D. sph decentered 1 cm. gives 3Δ , and since only 1Δ is needed, a decentration of $\frac{1}{3}$ cm. for each lens will satisfy the requirements. To avoid unnecessary expense, the prescription should therefore be written:

O. U. + 3 D. sph. decentered $\frac{1}{3}$ cm. toward the temples, by which we mean that the thick edge of each lens should be placed at the temples, as in Fig. 1.

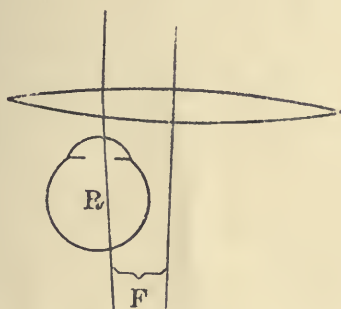


FIG. 1.

The dispensing optician's ability to apply the law of decentration is hampered only by one obstacle at present, namely, by the limited size of the lenses now furnished by the manufacturers.

These lenses, as they are usually supplied to the trade, are capable of a decentration of only $\frac{1}{3}$ cm. laterally, and $\frac{1}{2}$ cm. vertically. But even under these circumstances there are many prescriptions in which decentration may be profitably utilized. For instance:

PRESCRIPTION No. 2.

O. D. — 2 cyl. 180 \bigcirc 2 Δ base up.

O. S. — 2 cyl. 180.

Might be written:

O. D. — 2 cyl. 180 decentered $\frac{1}{2}$ cm. down.

O. S. — 2 cyl. 180 decentered $\frac{1}{2}$ cm. up.

The decentration of $\frac{1}{2}$ cm. on a 2 D. cyl. produces 1 Δ , so that 1 Δ base up on the right eye, and 1 Δ base down on the left is equivalent to 2 Δ base up on the right alone. The term "decentration" signifies a displacement of the lens-center—relatively to the visual axis; hence, a decentration of $\frac{1}{2}$ cm. "down" on the part of the axis of the cylinder means that the axis is displaced downward, thereby placing the thick edge of the lens up, as in Fig. 2.

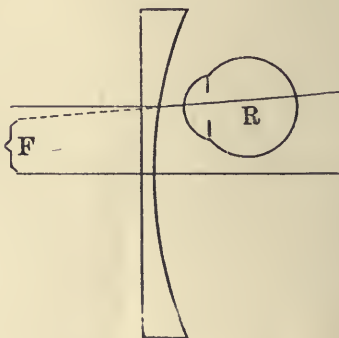


FIG. 2.

As another example let us cite a case in which the examination results in

PRESCRIPTION No. 3.

O. D. + 4 D. sph. \bigcirc 2 Δ base out.

O. S. + 2.75 D. sph. \bigcirc + 1.25 cyl. 180 \bigcirc 2 Δ base up.

In this instance the lens of the right eye would require to

be decentered $\frac{1}{2}$ cm. "out" to secure 2Δ , since 4 D. decentered 1 cm. gives 4Δ . We know, however, that $\frac{1}{2}$ cm. decentration is in excess of the $\frac{1}{3}$ cm. which is the limit of the ordinary lens laterally.

But, if we turn our attention to the left lens we see that it is possible to call upon the 2.75 spherical to supply a part of the lateral prismatic action, as the necessary displacement can be made along the cylinder's axis without implicating the cylinder. In other words, there are 6.75 D. of spherical power before the two eyes which may be called into requisition to provide an equivalent to 2Δ base out for one eye.

The 6.75 D. decentered 1 cm. gives 6.75Δ , or decentered 1 millimeter $= \frac{1}{10}$ of $6.75 = 0.675\Delta$. As 2Δ are needed, it will take $3 \times 0.675 = 2.025\Delta$, that is to say: a decentration of 3 millimeters on the part of each lens toward the temples.

The left eye calls for 2Δ base up. We have vertically $2.75 \text{ sph} + 1.25 \text{ cyl. } 180$, equivalent to 4 D. of refraction, and capable of producing 2Δ by a vertical decentration of $\frac{1}{2}$ cm. $= 5$ millimeters. The prescription should therefore read:

O. D. + 4 D. sph. decentered 3 millimeters out.

O. S. + 2.75 D. sph. \bigcirc + 1.25 180 decentered 3 millimeters out and 5 millimeters up.

These examples suffice to show how easily and correctly these prescriptions may be executed without incurring the additional expense of grinding prismatic surfaces. This expense should only be incurred in those cases where decentration is impossible on account of insufficient size of the lenses. A glance at the prescription will determine at once which of the methods to apply. Take, for example a case like

PRESCRIPTION No. 4.

O. D. + 1 sph. \bigcirc 1Δ base out.

O. S. + 1 cyl. 90° \bigcirc 1Δ base out.

As our commercial lenses are too small to bear a decen-

tration of 1 cm., it would be necessary to grind the lenses as the prescription is written, though even in the above case, to lessen the expense of the left lens, it is preferable to write:

O. D. + 1 sph. \bigcirc 2 Δ base out.

O. S. + 1 cyl. 90°.

In this event care should be taken to match the lenses as nearly as possible in thickness.

It would be a great convenience to have the optical companies manufacture a series of lenses capable of a decentration of at least 1 cm. Such lenses would not require to be larger than 6 cm. in diameter, and could be confined to the weaker powers, say from 0.25 to 2 diopters. The cost of such lenses would certainly not be greater than that of sphero-prisms, and would offer many opportunities of applying the prism-diopter expeditiously, with greater accuracy and less inconvenience to the dispensing optician.

TRANSLATION.

ON THE HEMIANOPIC REACTION OF THE PUPIL.

BY DR. S. E. HENSCHEN, UPSALA.

*From Clinical and Anatomical Contributions to the Pathology
of the Brain.*

[Part III., Pages 100 to 115.]

In 1881 Wilbrand demonstrated from clinical experiences, that in cases of lesion of the optic tract, the pupillary reflexes and the perception of light must correspond.

From theoretical reasoning Wernicke,¹ in 1883 formulated the opinion, that the pupillary reaction must be a different one when, in a case of lesion of the optic tract, the right or the left half of the retina is stimulated in front of the point where the pupillary fibres, on their way to their centre, leave the course of the optic fibres. Wernicke located this centre in the corpora quadrigemina. He says, "centripetally each optic tract is connected with a reflex centre in the corpora quadrigemina. A hemianopic pupillary reaction results, when one tractus is transversally severed or its conductive faculty is destroyed."

This locally diagnostic reaction was soon acknowledged by different authors, as Mauthner (1885), Moebius (1886) and Philipsen (1886); but, it seems, that none of them had reported cases in proof. According to Wernicke, the hemianopic pupil-

¹S. Wernicke, *Gesammelte Aufsätze*, 1893, p. 211, 325, Anm. 48.

lary reaction is not alone a theoretically formed symptom, but proven by a great many analogous observations. He relates, himself, that in a case of lesion of the chiasm, viz.: bitemporal hemianopsia, he has seen such a pupillary reaction. However, I have not succeeded in finding the description of this case in the literature. The practical value of this new symptom was, at a later date only, demonstrated by exact clinical observations.

The clinical observation of the hemianopic pupillary reaction is difficult. Samelsohn stated, that it was sufficient to illuminate the fundus with a common candle in order to produce the reaction. However, generally, I did not succeed as easily as that, in producing it. Formerly I threw, in a dark room, a light-cone concentrated by a convex lens by means of the ophthalmoscope into the eye which was turned outward or inward, taking especial care, not to strike the macula lutea with the light. During the last years, I use a lamp especially conducted for this purpose. The light is surrounded by a tin-tube in order to exclude all the light-stimulus and the light-cone can emerge solely through a hole in a diaphragm; it is then concentrated by a convex lens. With such a lamp it is easy to give the light-cone the desired direction.

Yet, even under these circumstances it is sometimes difficult to ascertain whether the reaction varies in strength, when light is thrown into the eye from different sides. When the pupillary reaction is weak from other sources (as in old people, in cataract cases) the difficulty increases in judging whether there is a hemianopic reaction or not.

[Here follow the clinical observations in 36 cases, giving partly positive, partly negative results; in 8 of these the brain lesion was located behind or laterally from the external corpus geniculatum; in 9 cases it was situated in the central ganglia; in 10 cases it concerned the optic tract; in 7 cases the chiasms and in 1 case the optic nerve was the seat of the lesion. Having, further, considered these cases pathologically and having

sifted them with regard to the question at issue, the following is the summing up of the clinical results:]

- I. H. R. (hemianopic reaction) does not result :
 - (a) In malacia of the occipital, parietal and temporal lobes;
 - (1) Even, if the lesions are large, or if
 - (2) The lesion has nearly reached the neighborhood of the corpus geniculatum.
 - (b) In tumors in the region named,
 - (1) Even, if they are large, or
 - (2) Have destroyed the optic fibre radiation or have exerted slight pressure on
 - (3) the pulvinar, or
 - (4) the corpora quadrigemina from behind.
- II. (a) When a tumor has reached the immediate vicinity of the frontal optic fibre course, the H. R. may not be plain, or incomplete, even if the course of of these fibres has not been interrupted.
 - (b) A large tumor may (exceptionally?) from the fossa Sylvii press so strongly against the tractus, that H. R. results, if, at the same time, the intracranial pressure is considerably increased.
- III. H. R. results, as a rule, in lesions of the tract, even, if they are very small.
- IV. Lesions of the external corpus geniculatum do not seem to produce H. R., as, for instance,
 - (a) when it is inflamed, or
 - (b) the seat of a gumma or another form of tumor, or
 - (c) of malacia.
- V. Whether a lesion of the internal corpus geniculatum can cause H. R. is not known.
- VI. H. R. does not seem to result from destruction of the pulvinar, neither
 - (a) in malacia, or scar-formation, nor
 - (b) when a slight pressure is exerted upon the ganglion.

- VII. H. R. does not follow the destruction of the posterior corpora quadrigemina.
- VIII. H. R. results from
- (a) extensive tumor-infiltration of the posterior part of the tractus and pulvinar (pressure on the tractus?), and from
 - (b) extensive destruction of this region (consequent upon destruction of the brachium anterius?).
- IX. H. R. results from affections of the chiasm (especially syphilis) with bitemporal hemianopsia; often, however, it is lacking from unknown causes (as in tumor of the hypophysis? or syphilis [Uhthoff's experiences]).
- X. H. R. may be found in cases of fracture in the neighborhood of the foramen orbitale with monocular hemianopsia.
-

We now leave the clinical part of the question to treat of the anatomical one.

The question of the course of the centripetal pupillary fibres is of interest in a theoretical as well as in a practical direction. Only, when we know the anatomical course of these fibres, will we be able to appreciate the diagnostic value of the pupillary changes in a special case.

The dogma of the hemianopic pupillary reaction starts from the supposition that there are separate fibres for pupillary reflexes, and that these fibres behave in the chiasma like the other nerve fibres concerning their decussation, that, therefore, they also show a partial decussation, and that after the decussation their course coincides in the tractus with that of the other optic nerve fibres. Such a condition, furthermore, seems *a priori*, the most probable and the very existence of a hemianopic pupillary reaction is in the highest degree apt to affirm such an opinion. The anatomical proof, however, seems still to be wanting. As far as I know, nobody has as yet succeeded in isolating anatomically the centripetal pupillary fibres from the others or to follow up the course in the anterior optic portion.

Moreover, I hardly think that this problem could be solved by means of the anatomical examination alone, even if prominent anatomists should take up this research. It is probably superfluous, here, to relate the historical development of the question concerning the course of these fibres. I will only mention, that, according to Meynert, the radiating fibres which from the nuclei of the anterior corpora quadrigemina penetrate into the gray matter of the aquæduct, conduct the reflexes from the optic nerve fibres, which enter the corpora quadrigemina, to the nuclei of the oculomotor nerve.

Forel denies the existence of such fibres as well as their function as supposed by Meynert.

In a purely anatomical manner we have hardly progressed any further than Meynert. That is, we can prove that fibres from the optic tract enter the anterior corpora quadrigemina; and Ramon y Cayal has shown, that these supposed optic nerve fibres end here, shaped like little trees; yet, anatomy alone cannot furnish the proof that these fibres are the conductors of the pupillary reflexes.

By experiments only and by clinical-anatomical research, may we succeed. Different investigators have worked at this problem. Especially Gudden, Bechterew and Darkschewitsch have tried to solve it experimentally and have reached differing results.

By removing portions of the brain, in rabbits, Gudden came to the following conclusions: When one colliculus anterior corporis quadrigemini is removed, say the right one, the opposite eye of the animal is blinded. The left eye has no vision, the pupils, however, act normal in both eyes. When both anterior colliculi are removed, the animal is blind, but the pupils react normally. When, however, together with the anterior right colliculus a piece of the thalamus, lying in front of it, is removed, there results besides the leftsided blindness, an excessive dilatation of the pupil of the blind eye. In both cases a diffuse, but incomplete atrophy results in the left optic nerve. "There are, therefore, two centres in existence, each one with a separate system of fibres, a visual centre (anterior

colliculus) and one lying in front of it, by which reflexly the contraction of the pupil is governed." A third centre lies in the outer corpus geniculatum.

Darkschewitsch reached very similar conclusions. According to him, the pupillary fibres follow the tractus, leave it in the region of the external corpus geniculatum, and run through the thalamus opticus to the hypophysis and to the ganglion habenulæ, and from there the reflexes are conducted to the nuclei of the oculomotor nerves by means of fibres of the posterior commissure. * * *

This opinion, that the pupillary fibres run through the thalamus, seems to be participated in by Bellonci, who made extensive comparative anatomical researches.

Mendel, also, joins Darkschewitsch in so far that he sees a pupillary ganglion in the ganglion habenulæ. Having removed the iris in newly-born animals, he found atrophy of the ganglion habenulæ and of certain fibres of the posterior commissure. The reflex course of the centripetal pupillary fibres is then according to Mendel: Opticus, chiasma, tractus opticus, without crossing to the ganglion habenulæ, commissura posterior to Gudden's nucleus and to the oculomotorius.

According to Bechterew the centripetal pupillary fibres take a different course.

His experiments lead him to the opinion that these fibres run in the optic nerve only to the chiasm, that, however, further on they do not follow the tractus or penetrate into the corpora geniculata, but enter behind the chiasm, immediately and without crossing, into the gray matter of the third ventricle, from where they reach the oculomotorius. In this course they do not cross. There is no centre in the floor of the third ventricle but only a part of the centripetal course of the reflex arc; the centre itself lies in the nucleus of the oculomotorius.

These results were gathered from experiments on dogs. One optic tract being cut, hemianopsia resulted, but no change in the width and motility of the pupils. Also, after the anterior colliculi of the corpora quadrigemina had been destroyed

and after lesion of the lateral corpus geniculatum, the reaction of the pupil to light did not cease in dogs.

However, as Heddaeus remarked and every clinician knows, who has observed the hemianopic pupillary reflex, this conclusion is premature, since, in consequence of the partial decussation of the pupillary fibres in the chiasma, even after destruction of one tractus, an alteration in the pupils is lacking on account of the action of the light-stimulus on the other half of the retina and on the macula lutea, the nerve supply of which is bilateral. As Heddaeus states correctly, such an alteration could only result when both tracts have been destroyed. * * *

* * * Christiani, also, has demonstrated a relation between the wall of the third ventricle and the pupil. * * *

* * * As has been stated above a lesion in the occipital course of the optic fibres never produces the hemianopic pupillary reflex, unless the lesion by its nearness influences noxiously the frontal course. From this we see, that the pupillary fibres do not lie in the occipital optic fibre course, they at some point deviate before the beginning of this course towards the middle line.

There can, on the other hand, remain no objection, that the pupillary fibres run in the tractus. Dryden's case and, still more, the one observed by me and examined microscopically, and in which I found a minute malacia in the anterior part of the tractus, opposite the frontal part of the pes, prove, that there are pupillary fibres in this locality. The pupillary fibres, therefore, do not, as Bechterew thinks, deviate from the tract at the chiasma into the wall of the third ventricle, but do so later on.

This conclusion does not conflict with the other cases in which a hemianopic reaction was caused by a lesion of the tractus, nay, it is rather confirmed by them. * * *

* * * I now come to the question: Where do these pupillary fibres leave the tract in order to reach the thalamus? From what we stated above, we know that they follow the tractus at least to the frontal margin of the pedunculus cerebri;

but, do they enter the external corpus geniculatum, or not? According to Darkschewitsch and Bellonci the pupillary fibres leave the tractus in the region of the external corpus geniculatum. It would, however, be of interest if we could decide whether they do so within or in front of the corpus geniculatum externum. It is not impossible, that a finer local diagnosis could be made, if we could really demonstrate that the pupillary fibres deviate towards the median line in front of the corpus geniculatum.

In fact, I have observed a number of cases which support this opinion. In case No. 14 (which is described in extenso) an apoplexy was followed by permanent hemianopsia with word-blindness and rightsided hemiplegia. During his illness of several years, the patient had repeated epileptic attacks and with them the hemianopic pupillary reflex appeared very plainly, while it disappeared in the free intervals. This variation was observed several times, but shortly before his death no hemianopic pupillary reaction existed. Post-mortem, I found a well defined primary lesion in the left external corpus geniculatum.

A secondary atrophy of the tractus and both optic nerve was easily demonstrated.

Since, in spite of the destruction of the corpus geniculatum, the hemianopic pupillary reaction, was not constant, it seems justifiable to conclude, that the pupillary fibres do not run through the corpus geniculatum, but that they deviate in front of the ganglion towards the median line into the substances of the thalamus. The case is, however, not perfectly unobjectionable, because the corpus geniculatum was not perfectly destroyed and it might be, that the pupillary fibres passed through the intact part of the ganglion. * * *

* * * All these cases agree with each other, and if alone by itself not every one of them could be considered a sure proof, in their entirety they speak forcibly for the fact, that *the pupillary fibres do not enter the external corpus geniculatum.* * * *

* * * The pupillary fibres, therefore, probably deviate

towards the median line between the frontal margin of the pedunculus cerebri and the external corpus geniculatum. By means of the microscope, it is easily seen, that in this place no fibres deviate in a medial direction, except the medial root of the optic nerve and the very many fibres which traverse the most posterior part of the pedunculus to an extent of several millimetres. These fibres are very numerous. It is, therefore, indicated to look among them for the pupillary fibres. These fibres largely enter into the formation of the medial root. Some of them turn around the occipital margin of the pedunculus and then run along the medial margin of the pedunculus forwards toward the Luysian body. Their main body, however, divides into two fascicles, a lower one and a more superficial one. These encircle the inner corpus geniculatum or enter the ganglion. It is probable that here we have to look for the pupillary fibres. * * *

* * * The delicate question where the course of the pupillary fibres lies in the vicinity of the inner corpus geniculatum, can only be decided by repeated observations which combine clinical and anatomical research. The anatomical examination must be microscopical and concern especially the condition of the lower and the superficial fascicle of the medial root of the optic nerve. * * *

We have now traced the pupillary fibres to the medial margin of the inner corpus geniculatum; between this point and the pupillary nucleus in the gray of the aquæduct, lies only a short space.

Where do the pupillary fibres end? That is the last question.

I will here call to mind, that although we do not know as *a certainty* how they end, yet every analogy points to it, that the pupillary fibres have their ganglia in the retina and that they end with terminal ramifications in the usual manner. * *

* * * At present we seem to have final clinico-anatomical proof that the pupillary fibres end in the colliculus anterior, although this is in the highest degree probable. In analyzing my cases (described in this work) I have preliminarily

assumed this to be the case, however, I will *here particularly emphasize, that I do not as yet consider this opinion to rest on a scientific foundation.*

A few more words concerning the *radiary* fibres, found in the colliculus anterior. Several authors have declared them to be the pupillary fibres. I, therefore, wish to state, that these fibres are found, even where there is a total atrophy of the optic nerve. In my case 1, they were preserved; also, in case 7, in which a hemianopic pupillary reaction denoted the destruction of the pupillary fibres on the right side and a cyst severed the pulvinar from the colliculus anterior, they were easily visible. This proves that they do not atrophy with the pupillary fibres, but probably start from the cells of the white substance of the colliculus anterior and are connected with the fibres of the stratum lemnisci, which probably bring about the opticus-oculomotorius reflex.

With this question concerning the course of the pupillary fibres in the thalamus, is connected the question about the symptoms which would accompany a lesion in the portion of the pupillary fibres just treated on. As long as the lesion concerns the tractus, hemianopsia must, of course, result; if, however, the lesion strikes the pupillary fibres medially from the tractus (the medial root up to its end), it is clear, that a *hemianopic pupillary reaction* must result, but *without hemianopsia*. The fibres pass near the inner corpus geniculatum and since, in all probability, this ganglion is of a similar importance for hearing, as the external colliculus is for vision, such a lesion might be accompanied first by deafness, than by diminished hearing, in the opposite ear; that is, if the lesion happened to be leftsided the right ear would show diminished hearing.

Furthermore, there are the sensible fibres in the vicinity of the inner corpus geniculatum; a lesion concerning them means anæsthesia. If the lesion progresses further, hemiplegia may result.

As far as I know, such a lesion has not yet been clinically observed. Since lesions in this region are quite frequent, I

have for several years looked for such a case, but so far unsuccessfully.

The complex of symptoms just mentioned might be *pathognomonic for the region between pulvinar and thalamus*, and be of practical value, since it would speak against a surgical interference. * * *

* * * From the foregoing, it is clear that the hemianopic pupillary reaction is of importance not only theoretically, but also practically for a local diagnosis. However, only further researches can fully clear up the course of the pupillary fibres and thus demonstrate finally, the real value of the hemianopic pupillary reaction.

One more word concerning the local arrangement of the pupillary fibres in the frontal optic fibres. How are they arranged in the retina, optic nerve and tractus?

The observation, that a pupillary reflex can be obtained from any point of the retina, makes it probable, that the pupillary fibres are evenly distributed over the retina. * * * Concerning their arrangement in the optic nerve; the well-known researches of Key and Retzius teach, that the optic fibres in man differ in calibre. It is, therefore, also probable that they have different functions. There are two kinds of fibres which are intermingled. In 1882, Gudden has demonstrated two systems of fibres in the optic nerve, one of optic fibres and one which governs the reflex-action of the pupil. After destruction of the colliculus anterior (in rabbits) he found in the optic nerve of the opposite side "a considerable accumulation of the thick fibres," *i. e.*, atrophy of the thin fibres. This atrophy in the retina was a general, not a local one.

A case of Wilbrand's, communicated to me by letter, in which a hemianopsia following an injury of one optic nerve was accompanied by hemianopic pupillary reaction, seems to prove that the visual and the centripetal pupillary fibres for a certain portion of the retina, lie close together in the optic nerve.

Concerning the chiasma, we know only that the pupillary fibres undergo here, also, a partial decussation; the existence

of the hemianopic pupillary reaction proves that. * * *

* * * Where the pupillary fibres lie in the tractus, is at present perfectly unknown. * * *

* * * The only case, which, according to my knowledge, is likely to teach anything regarding the position of the pupillary fibres in the tractus is my case (No. 20), in which a microscopical atrophy in the dorso-medial edge of the right tractus caused in the left eye a well-marked, and in the right eye an imperfect hemianopic pupillary reaction. This case, therefore, points to it, that the pupillary fibres form a separate bundle at the dorso-medial edge of the tractus. Yet, this case is so far an isolated one.

SOCIETY PROCEEDINGS.

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

THURSDAY, NOVEMBER 8, 1894.

STEPHEN MACKENZIE, ESQ., M.D., Vice President, in the Chair.

LAMELLAR CATARACT AND RICKETS.

MR. TREACHER COLLINS read a paper on this subject. He pointed out how the opinion of Davidson and Horner, published in 1875, that lamellar cataract was the result of rickets, though widely accepted on the continent, was not even referred to in a large number of the text-books on eye disease in this country. He then read several communications from physicians and ophthalmic surgeons, collected for him by Dr. Barrett, of Melbourne, and Dr. Symonds, of Adelaide, as to the relative frequency of these two diseases in South Australia. The evidence thus obtained went to show that in Adelaide rickets is a very rare disease, and lamellar cataract very unusual. In Melbourne rickets was, until recently, comparatively rare; it is more common now, but the severity of the affection is much less than in the old world. Lamellar cataract is exceedingly rare, and the honey-combed condition of the enamel of the teeth is not often observed.

In Sydney, the oldest city in Australia, rickets is said to be as common as in England, but he had no information as to its comparative severity. Lamellar cataract is less frequent than in this country. In a recent visit he had paid to Persia,

Mr. Collins had endeavored to ascertain the amount of those two diseases there. He was assured by the medical men he met that rickets is uncommon; the conditions of life, moreover, are not such as are usually considered likely to favor its development. Amongst a very large number of eye patients whom he had seen in that country, there was only one case of lamellar cataract.

MR. MARCUS GUNN said it was still a moot point whether the condition of lamellar cataract was brought about by changes before or after birth. The decision of this point would have an important bearing on the question of association with rickets.

MR. JONES, who had spent twelve months as house surgeon, and three months as ophthalmic house surgeon in Australia, said that he had seen no case of lamellar cataract or of rickets there.

MR. SYDNEY STEPHENSON stated that he had examined all the new comers to one parochial school, in all about 5,000 children, and that among these he had only found four cases of lamellar cataract, the striæ being very delicate and easy to overlook. Rickets was very common, and its effects were readily discerned in children of five or six days.

MR. SILCOCK referred to the President whether both conditions might not be due to one common cause.

MR. POWER said that many lamellar cataracts were congenital, and belonged to a period antecedent to that at which rickets occurred.

MR. LANG contended that the changes in the lens involved the entire nucleus as well as the periphery, and that this as well as the development of the enamel, dated from before birth. He thought the whole change was ante-natal.

MR. MARSHALL thought that the occurrence of fits, lamellar cataract and defective development of the enamel being in each case referable to abnormal change in the epiblast, was probably associated with some ante-natal defect in the central nervous system.

MR. LAWFORD, referred to the interference with the growth

of the enamel occurring after birth, quoted the domestic cat as being sometimes the subject of lamellar cataract. Similar changes in the lens of the rabbit, as observed by Bowmann, were quoted by Mr. Lang, and in the eye of the Australian bear, by Mr. Marcus Gunn.

THE PRESIDENT said that observers had not yet paid much attention to the association of lamellar cataract and rickets, and he was not sure how far such a connection was established. He knew of no common cause of this condition and changes in the enamel organ. It was difficult to say whether the opacities in the lens were developed, or only discovered after birth.

MR. TREACHER COLLINS, in reply, said that though most of the speakers appeared to dissent from the proposition involved in his paper, none had attempted to explain the absence of both conditions in Australia. Rickets was to a great extent an evanescent disease, and its traces could not always be expected to be recognized in the subjects of lamellar cataract. The mode of development of this latter condition was little known, as attention was only called to the lenses when the sight had become markedly defective. Calcification of the permanent teeth occurred about the time that rickets prevailed. He met the suggestions of cataract in the lower animals by quoting Mr. Bland Sutton's observations on rickets in males.

COMPLETE ANKYLO-BLEPHARON.

MR. KENETH CAMPBELL (Cairo) communicated a paper on this subject. The patient, a native of Upper Egypt, aged 50, presented himself with a large rounded tumor which completely masked the right orbit. There was no evident appearance of a palpebral fissure. The swelling was dull red and shiny, with some large veins on the surface, and measured laterally 4.8 cm., vertically 3.2 cm., and projected forward 3.2 cm. from the orbital margin; it was tense, fluctuating, and moved co-ordinately with the lid of the other eye. The man stated that the sight had been lost since childhood, and that the swelling had appeared before on more than one occasion, but had subsided

under poultices. A minute examination disclosed a trace of palpebral slit, without eye-lashes, at the extreme lower margin of the tumor, and the opinion was formed that the case was one of complete ankylo-blepharon with retained and probably semi-purulent lachrymal secretion. This was confirmed on the day preceding that fixed for operation by the perforation of the skin in the center of the upper eyelid, attended by escape of semi-purulent fluid and total collapse of the tumor. The palpebral slit was re-opened and the conjunctival sac dilated to obviate recurrence, but no attempt was made to re-establish the lachrymal channels owing to the great alteration of the parts by cicatrization.

NEW YORK ACADEMY OF MEDICINE.

SECTION OF OPHTHALMOLOGY AND OTOTOLOGY.

OCTOBER 15, 1894. JOSEPH A. ANDREWS, M.D., CHAIRMAN.

BLEPHARITIS.

DR. C. H. MAY presented a case of chronic blepharitis which was remarkable on account of the great hypertrophy of the margin of the upper lid of both sides. The right upper lid became affected, a year and a half ago. After the use of the yellow oxide of mercury ointment, it was very much improved and its size diminished from a thickness of half an inch to a quarter of an inch after six months. One year ago the left upper lid began in the same way, and although also treated with the yellow oxide of mercury ointment, it has not improved in any way; it now presents a tumefied margin fully half an inch in thickness, with an increase in the number and in the loss of lashes; the latter, when pulled out, showed that each hair follicle was surrounded by a considerable amount of pus.

DR. H. KNAPP suggested the use of nitrate of silver, two or three per cent., to the external surface, and one per cent. to the internal surface of the lid. There was no other discussion regarding the treatment of this case; the opinion was pretty general that operative interference was not advisable.

REMINISCENCES FROM A VISIT TO SEVERAL OPHTHALMOLOGICAL AND OTOTOLOGICAL CLINICS OF EUROPE.

DR. KNAPP.—I saw Wecker and Schweigger do strabismus operations. Wecker does the operation by dividing the tendon from the center to the periphery—the method which was original with Snellen, and published as long ago as 1874.

Wecker makes a vertical incision of the conjunctiva, seizes the muscle, button-holes it, and cuts both upward and downward so as to divide the whole tendon, after which he unites the wound by a meridional suture. Schweigger passes a curved hook under the muscle, also making a vertical incision of the conjunctiva, and then, having loosened the lower border of the muscle, he passes a curved hook underneath it, and cuts first in the center and then up or down until the whole muscle is divided. He unites the conjunctiva with a vertical suture. The division of the tendon from the center to the sides is done to avoid any asymmetry in the contraction of the muscle when it has formed its new attachment.

I have seen both Wecker and Schweigger do advancements. The former makes a folding of the muscle in the manner that has been generally adopted. It is not only the capsule that is grasped and advanced, but the muscle itself. I find that two sutures often give an insufficient effect, and I have therefore added a third suture which passes through the center of the tendon. Schweigger's advancement is entirely different, and quite original. He measures the degree of strabismus linearly. He says the measurement by angles is of little value. In order to obtain equilibrium of the muscles afterward, he shortens the muscle exactly by the quantity of which the eye is displaced. This, he says, can only be measured linearly. He makes an incision through the conjunctiva, and then dissects the muscle from the conjunctiva. Having done this, and isolated the muscle, he passes a curved probe underneath it, freeing the tendon and muscle from the sclerotic on its inner surface. Then he passes another curved probe underneath the equatorial end of the exposed tendon, measures off the quantity by which he wants to shorten the muscle, introduces one end of a double-needle catgut thread through the equatorial end of the tendon from above, and then repeats this with another double-needle catgut thread from below, cuts the tendon between the probes and ties each catgut thread; then securing the end of the muscles, he passes the four needles through the stump of the tendon and adjacent episcleral tissue,

ties each pair of threads on the corneal side of the tendon, thus draws the muscle forward, and attaches it firmly to the insertion of the tendon. I will not say that it is better than other and more widely known methods, but it certainly answers the purpose very well. He then covers the field of operation by stitching the conjunctiva. He keeps the patient at the hospital for several days. The wound swells a little in every case, but he has never seen any bad results following it.

As to the indication for squint operations, I might say that there is still a great deal of uncertainty in Europe. In Edinburgh the idea was advanced that there should be much more advancement done than tenotomy. For the last nine years I have done a great many advancements with the object of restoring the elasticity of the muscle, but I have gradually returned to the simple tenotomy, and instead of curing squint on one eye, in the majority of cases I divide, as I formerly did, the operation between the two eyes. There is not the slightest doubt, I think, that in squint, the squinting muscle is considerably contracted. There is an increase of mobility, and the abnormal degree of this mobility is what we should reduce. We can do this without the least harm. If the antagonizing muscle is weak, then advancement is proper. When there is a high degree of strabismus, we get the better result by an advancement and a simple tenotomy. The result depends upon the individual case, and upon the manner in which the mobility is distributed among the different muscles. These statements are trite, but I repeat them because there were some very extreme notions promulgated at the Edinburgh Congress.

Now, I should like to speak of cataract. I have seen Panas and Schweigger make cataract operations. Neither of these operators are ambidextrous, and this makes them more or less awkward. For instance, Panas operates the right eye with the right hand, standing behind the patient, and the left eye also with the right hand, standing on the side of the patient, so that he has to cut upward. I saw him do an operation where the knife passed with difficulty, came out with a jerk, and the lens and vitreous came out also. When this ac-

cident occurred, he simply shut the eye up and did not look at it again. Schweigger operates on the right eye with a Graefe knife upward, and on the left eye with a Baer's knife downward. For my part, I prefer to make all extractions upward. Schweigger makes a number of preparatory operations. He simply divides the anterior capsule, and claims that this is the only efficient way. Five or six days afterward he extracts. This is the old Graefe method. McHardy, in the majority of cases, makes an iridectomy and trituration (Foerster's method). He also extracts soon afterward. I do not consider these procedures harmless; they certainly produce congestion and irritation, and, therefore, when the extraction is performed, the eye is not in so quiet a condition as it would have been if the preparatory operation had been omitted. Schweigger gets the cortex out by rubbing the cornea very freely. He does not do this with the eyelid, but with a rubber spoon.

Pannas operates on prolapse usually rather late. I saw him do two very interesting operations of this kind. The prolapse was very large, and had existed for three or four months. He did the operation with his characteristic thoroughness. He cocaineized the eye fully, then excised the protruding part of the iris, and afterward seizing it with forceps, cut out with scissors everything that lay in the wound. He not only cut out the iris, but also the pencils of connective tissue which penetrated the wound into the vitreous. This tissue was rather dense, and showed that connective tissue formed in such a wound just as it does in accidental injuries. I was rather struck with the boldness with which he operated on these cases. If I had such a large prolapse to operate upon, I certainly should not wait three or four months until these dense connective tissue bands had formed; it would be very much better, in my opinion, to cut the prolapse in the second or third week, before such dense bands had a chance to form. What prolapses can be cut? I think the small ones can be left to Nature, but the larger ones can be cut early—within a week or two, unless there be much inflammation present.

With regard to secondary cataract, I would say that Pa-

nas performs division in cases in which the capsule is thin. Secondary operations are not frequently performed in Europe; they do them principally where inflammatory products obstruct the pupil so as to seriously interfere with vision. In these cases they do either an iridectomy or an extraction of the secondary cataract. Panas says that extraction is the method for all cataracts—the hard and soft cataracts, and the secondary as well as the primary cataracts. As soon as there is hardened tissue in the capsule he considers it better to excise it. He thrusts a lance-shaped knife through the cornea, and pierces the secondary cataract with a forceps, one branch of which is pointed and the other blunt. He then pulls it out and cuts it. I saw him fail in one of these operations; he did not get the thickened capsule out. All forceps devised for this purpose are liable to fail.

In Paris I saw a new operation done by Kalt—stiching up the wound in a peculiar way after extraction. He had done it in fifty consecutive cases, with the object of preventing prolapse. I saw him do five of these operations. First he passes a silk thread through the upper part of the cornea, leaves a small piece of the limbus free, and passes the same thread through the adjacent episclera. The piece of thread lying over the free part of the cornea is drawn aside toward the nose. His section was as accurate as if it had been done by machinery. Having made the section, he completes the operation in the ordinary way. When the lens had been removed and the cleansing was completed, if the iris had not gone back to its proper position, he reduces it, and ties the knot so tight that the cornea wrinkled. He says no inflammation and suppuration follow this. The sutures are allowed to remain for four or five days, and are then removed without difficulty. The small passage of the needle through the upper part of the cornea, he says, leaves scarcely a perceptible trace. I examined several of his cases, and can testify regarding this point. He did not entirely prevent prolapse. In one case there was a large escape of the vitreous. He paid no attention to the vitreous; tied the suture in the ordinary way, and

afterward there was as good a closure as if no vitreous had escaped. This the operator explained by saying that the thread cuts the vitreous off. The operation is rather a complicated procedure, yet I have been quite favorably impressed by it.

I wish to speak about the *Quinze-Vingts* Hospital in Paris—for operative material, one of the largest eye hospitals in the world. The poor are treated and kept free. It is also a free asylum for the incurably blind. They have lately added a new wing for contagious eye diseases. Their method for treating blenorrhœic eyes is peculiar. Kalt uses as an irrigator the common *Pulitzer* ear speculum. The broad end of this speculum is placed between the two lids, and the small end is connected by rubber tubing with an elevated vessel containing the antiseptic solution. The rim of the speculum draws the lids away from the eye, and thus allows of very thorough irrigation of the conjunctival sac. The irrigation is done twice a day. There could be no question about the thoroughness of the cleansing process, but it seems to me to be rather rough treatment.

I saw a good deal of rhinological and laryngological work in Europe. Adenoid vegetations are mostly diagnosed by means of the finger. At the *Hospital Lariboisiere*, in *Gouguenheim's* service, they use a modification of *Loewenberg's* forceps, by which they remove the pharyngeal tonsil easily by one or two introductions. They finish up with *Hartmann's* curette, which is not so liable to injure the Eustachian tube as is the *Gottstein* curette. I exhibit this forceps and *Renault's* tonsil ecraseur, which is excellent for removing fibrous palatal tonsils, covered with the arches of the palate. I find that in the majority of cases, mastoid operations in Europe had to be repeated.

The most important operation I saw while in Europe was done by *William Macewen*, of *Glasgow*, on a man about forty years of age, who had suffered for many years from otorrhœa. The mastoid showed the scar of a previous operation. The incision in the integument was close to the auricle, and about

two inches long. The bone was extensively laid bare and appeared normal. Sclerosis was diagnosticated, and verified by the operation. The whole operation was done by means of burrs rotated by a surgical engine, which was operated by hand power. The very dense bone was easily removed, and without splintering. The posterior osseous wall of the ear canal was removed down to the antrum. After having cleared the attic, the burr was applied to the posterior part of the sclerosed mastoid. From a small fistula, pus exuded, and this served as a guide. A shining patch of membranous tissue was finally exposed in a cavity which was evidently the posterior cranial fossa of the skull. This membrane seemed to be the inner wall of the lateral sinus. The case then was really one of extra-dural abscess. The ear canal and cavity of the mastoid were filled with a powder consisting of iodoform one part and boric acid three parts. A gauze and cotton dressing was applied, and confined with an elastic cotton roller bandage, which was not disturbed for about two weeks. I was particularly impressed with the value of the surgical burr in this operation.

Victor Horsley showed me a case of very great interest—that of a man with paralysis of the right arm, double optic neuritis, and a great diminution of sight. A large piece had been cut away from the parietal bone near the vertex, a tumor removed, and the bone replaced. Later on, the pressure symptoms returned, and it became necessary to remove the plate of bone, after which the symptoms were relieved.

DR. EMIL GRUENING.—I have seen Schweigger operate, in 1890, for advancement, and have been favorably impressed with the attempt made to secure mathematical accuracy. Another advantage is that there is considerably less swelling, and the third advantage is that it is not necessary to remove the sutures. Dr. Knapp has not referred to Panas' irrigation of the anterior chamber. I saw Trousseau operate at the Quinze-Vingts on six cases of cataract with nothing but a knife—no fixation forceps, no speculum, no cystitome.—*American Medical-Surgical Bulletin.*

SELECTIONS.

SCOPOLAMINE HYDROBROMATE.

BY ARTHUR G. HOBBS, M.D., ATLANTA, GA.

This new mydriatic is being tested now by some oculists, especially by those who are in charge of large clinics where it can be conveniently alternated with atropia, homatropia, etc., and the results compared. It seems at present to occupy a middle ground between atropia on the one hand, which is known to produce a complete paralysis of the accommodation and retain its effects for a week or ten days, and homatropia, which is claimed by some, and denied by others, to effect a complete control of the accommodative muscles and retain its effects only twenty-four hours. In the first case the time necessary to accomplish a full paralysis ranges from three to four days, and in the second only sixty to ninety minutes according to its advocates.

Scopolamine requires about two hours, with intervals of twenty minutes between the instillations, according to my observations, to bring about the desired result, and so far as I have been able to decide by comparative tests, the full effect is then reached quite as completely as that produced by a three days use of atropia. Its paralysis lasts from two to three days, so it occupies a place between these two leading mydriatics, both in the time of reaching its maximum effect and in the time of its complete decline. The above comparison is based upon the assumption of the advocates of homatropia that this drug produces a complete relaxation of the accommodative muscles in one to one and a half hours, the truth of which I

am not yet fully prepared to accept. In the same proportion that atropia is used, in a one half to a one per cent solution (approximately two to five grains to the ounce), and homatropia in a one per cent. solution (about four to five grains to the ounce), so scopolamine is used as a rule, in solutions of two to five grains to the ounce, although I prefer it in weaker solutions. It should be dropped into the eye at intervals of twenty minutes until four instillations have been made, when it may be assumed that complete paralysis of the accommodative muscles has been reached.

It has served me thus far in such refractive tests that have required complete paralysis of the accommodation quite as well as atropia, and while it does its work much more quickly, its decline is at most about one-fifth and oftener one-sixth of the time required when atropia has been used. Homatropia will be the mydriatic, however, when we can become convinced that it effects a complete paralysis of the accommodation in one hour or even in twice that time, since there can be no question of its more rapid decline. Scopolamine produces no unpleasant effects in the throat, and it allows a possible accommodation within a day and a half or two days after its instillation, although the pupil may not become normal for a day or two longer.

Great comfort may be extended to the patient, particularly if he should be a business man with few hours to lose from his work, by prescribing a weak solution of eserine (one-eighth grain to the ounce) in order to more rapidly reduce the size of the pupil and indirectly aid the restoration of accommodation.

Some have asserted that scopolamine does not increase intraocular tension, but its use has not yet been sufficiently extensive to fully warrant this statement. Should this be true, scopolamine would possess a great advantage over atropia, especially in older subjects. In some phlyctenular forms of keratitis, as well as iritis, when occurring beyond middle age, it seems particularly efficacious: indeed I have already learned to place more confidence in it and feel safer when using it in

such cases. Although it is much less expensive now than when I first began its use, about two years ago, its cost still restricts its general use.

We may hope that the consensus of opinion will in a year or two furnish us with a more accurate knowledge of this drug, to indicate to us when and in what cases it is preferable to atropia or homatropia, in case it should ever reach this point of usefulness.

It is my opinion that it will in many cases supersede the first, and entirely supplant the last, unless homatropia should prove itself equal to the occasion now claimed for it by many. In this later case homatropia would supersede both atropia and scopolamine for refraction work, and leave a very narrow field of usefulness for the latter. Since the contingency still exists, however, we may continue to use scopolamine, particularly where we fear atropia, as well as in refraction work.—*Atlanta Medical and Surgical Journal*.

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ORIGINAL ARTICLES.

SIDEROSIS CONJUNCTIVÆ IN CONNECTION WITH A PECULIAR GROWTH OF THE OCULAR CONJUNCTIVA.

BY ADOLF ALT, M.D., ST. LOUIS.

E. T., colored, male, æt. 21, called on me April 25, 1894, on account of a tumor of the left eye. This eye had been injured and had atrophied some four years previous to his visit. About nine months ago the eye had, further, been greatly irritated by a cinder. (He being a railroad hand, this statement goes for nothing, as with them every eye trouble begins with "a hot or cold cinder"). From about that day on he noticed a swelling in the lower half of the eyeball, which grew steadily up to the time of his visit. He was employed as a car cleaner.

I found a phthisical eyeball. The cornea which was quite transparent, showed an indrawn scar passing in a horizontal direction from the center of the cornea into the ciliary region. The semilunar fold was greatly enlarged and from the lower fornix a bag-like swelling protruded which extended from can-

thus to canthus. Its surface was lobulated, its sides were smooth and depressed from the pressure of the lids, when closed. The tumor showed several millimetres outside of the palpebral fissure. It had a broad base. Its surface which, thus, was always exposed to air was pigmented in parts, of a brownish red color, very similar to the general pigmentation of the skin of the patient. There was no sign of inflammation at the time and hardly any discharge.

I removed the whole growth on the next day and found that it offered a considerable resistance to the scissors. A profuse hæmorrhage followed the removal and was controlled with some difficulty. Otherwise, the healing was in no way interrupted.

The tumor, when hardened in alcohol, was an inch long, one-fifth of an inch broad and a quarter of an inch high.

On sections the base and, in fact, the bulk of the growth is seen to be made up of very tough, dense connective tissue, resembling a fibroma, yet, I think, more likely due to hypertrophy from a chronic inflammatory process. In this tissue are embodied numerous large bloodvessels and between them a smaller number of spaces filled with blood-corpuscles; since these spaces, have no blood-vessel-wall, this portion of the growth must be looked upon as a beginning angioma cavernosum. Farther on the tissue of the growth shows patches of round-cell infiltration, which in their arrangement are very suggestive of tuberculosis. They, however, show no giant-cells and, moreover, the repeated search for the tubercle bacillus has been altogether unsuccessful. These round-cell patches lie in the deeper parts of the tissue and nearer the surface; they, however, in no manner resemble, as might perhaps have been suspected, the granules of trachoma. This suspicion was the more natural from certain changes in the epithelial cells which will be referred to a little later on.

In general, the epithelium covering the whole growth is very hyperplastic. Instead of the healthy conjunctival epithelium, there are many layers of cells, which are flat and horny on the surface and get more and more columnar and cylindrical to

wards the underlying tissue. The epithelium, furthermore, forms innumerable pegs reaching far down in the growth, which are so closely packed together that there is no room for any tissue between them, so that the tumor greatly resembles an epithelioma. It is lacking however all other essential particulars.

The peculiar pigmentation seen on the surface of the growth, which appeared like the pigment in the patient's skin, is seen to be due, instead, to particles of dirt, iron and coal dust, which lie in the cementing substance between the cells. Wherever these particles are located, they have followed the epithelium way down into the tissue as far as the epithelial pegs dip in, and lie usually in their peripheral parts, yet, they seem nowhere to have entered the connective tissue underneath. The occupation of the patient, as a car cleaner, is undoubtedly responsible for this particular siderosis.

There are some further peculiarities found in the epithelial layer. A considerable number of glands penetrate from it into the depth to a varying degree. These glands are of the acinous type, opening on the surface with a wide duct. They are lined with an epithelium the cells of which are large roundish and oval, vesicle-like structures, here and there somewhat flattened against each other. Their nucleus always lies to one side near the periphery of the cell.

Whether these glands are newly formed in the tumor or whether they are simply Krause's glands which during the growth of the tumor have been drawn out of their position in the fornix conjunctivæ onto the surface of the new-formation, I am unable to decide, but I think the latter very probable.

However, these same oval or round vesicle-like cells are also found in great numbers and in many places in the epithelial pegs outside of these glands. Here they lie almost uniformly in the middle layers of the thick epithelial coat. Their longest diameter is not parallel with that of the other cells and they seem to reach to the surface in but few instances. Hæmatoxyline, eosine, carmine and methyl-blue do not stain the body of these cells. They have, however, a strange affinity for Bismark brown. This coloring substance they take up to a much higher degree than the surrounding

cells and tissues, so that they appear a dark black-brown.

I have seen, what appeared to be the same structures, many a time before in the conjunctival epithelium and have always looked upon them as cells undergoing a mucous degeneration which would later on be goblet-cells. Never, however, have I seen them in such immense numbers.

They appear exactly like the structures found and described by N. C. Ridley ("Some Points on the Histology of Trachoma," Transactions of the Ophthalmological Society of the United Kingdom, Vol. XIV., p. 24, etc.), and depicted on Pl. I., which he considers to be probably protozoa (perhaps gregarinidæ).

He gives the following reasons for concluding that these structures are not future goblet-cells:

1. They are far too numerous.
2. Some are found almost alone at a part where goblet-cells are not ordinarily found, and sometimes they are present in squamous epithelium.
3. Many are not in contact with the free edge of the epithelium as goblet-cells should be, but are in the deepest layers.
4. Many have their long axis not at right angles to the surface, as is the case with the goblet-cells, but in various directions, and in some cases even parallel with the surface.
5. Their reaction to staining fluids differs.

These points, thus mentioned by Ridley, almost exactly correspond with what is seen in the epithelium of the growth under consideration. Only in the glands the condition differs in so far, as almost all the epithelial cells within them appear of the same nature. If these structures are protozoa, this would not be so very astonishing, as the glandular cavities would serve very well for an appropriate domicile.

Ridley does not state, whether he has stained them with Bismark-brown. Certainly their especial affinity to this aniline-color is in my specimens so remarkable, that it is worth while to examine further into it. I know of no particular cells in the human organism which show this affinity. I am, therefore, the more inclined to accept Ridley's views on this subject.

TRANSLATION.

PARESIS OF THE ABDUCENS NERVE AND PNEUMONIA.

BY C. H. A. WESTHOFF, M.D.

November 16, a woman brought her little daughter Kath., two and a half years old, to my clinic.

The child was led by the mother's hand, the head turned to the right. While she stood before me, the head continually remained turned to the right, when I held her head firmly and placed the mother to the right of the child and ordered her to call to the patient, I saw, that the right eye could not be moved outwards. It remained fixed in the median line, while the left eye was moved fully towards the inner canthus. The movements of the right eye were normal in an upward, downward and inward direction.

There existed, then, a total paralysis of the right abducens nerve. The turning of the head towards the right, was done to escape the double vision. The ophthalmoscope showed nothing abnormal.

My colleague, Dr. Voûte, specialist for children's diseases, who held his clinic at the same time, was kind enough to examine the child and to report to me the following facts:

The child is the seventh one of a father 37 years old, and a mother, 35 years of age, who are both healthy. Having been fed artificially, it shows some degree of rachitis. No trace of lues. The child who formerly was always well, was suddenly taken with a vehement fever about two weeks previ-

ously. After the fever had lasted three days, the mother noticed the peculiar position of the head and had therefore consulted an oculist. The physical examination demonstrated a considerable apex pneumonia of the left lung. The cough was sparse; hardly any fever; all other organs were normal.

A week later the pneumonia was considerably improved. The motility outwards of the eye had increased. Another five days later the improvement was considerable and *pari passu* the paralysis of the abducens had grown much less noticeable.

December 7, but a very slight dullness could be found upwards and backwards and the paralysis was all but cured.

A few days later everything was normal. In this case, then, we had a paralysis of the abducens nerve which developed a few days after a considerable apex pneumonia had come on. At the time when then the pneumonia was at its highest, the paralysis was complete; and as the pneumonia disappeared, the paralysis grew less, and disappeared totally when the lung had regained its health.

It is, therefore, probable that we must assume a common cause for both affections, especially since no other cause, like lues, could be found.

In the literature at my disposal I cannot find anything concerning such a combination. Oppenheim alone says, without going into details, that paralysis of the oculomotor nerve has been observed after pneumonia.

It seems to me that from analogy we may assume a connection between the two affections. We often see paralyses of the accommodation after diphtheria. Donders was the first to prove the connection between these two affections. It is generally assumed that the paralysis is due to an intoxication of the nerve which governs the accommodation, by the toxins, which are produced by the bacillus of diphtheria.

We do not know, how this intoxication takes place, and why after diphtheria usually the same nerves are paralyzed; and we can as yet give no explanation.

The fact, however, that in diseases in which, after an in-

fection with bacilli, toxins are taken up by the blood, paralysis may develop, gives us a right in our case to assume a common cause for the pneumonia and the paralysis of the abducens, and this the more, since the healing of the two affections progressed *pari passu*. As soon as, due to the decrease of the focus of infection, less toxins entered the blood, the paralysis, too, grew less and when no more toxins were formed, it disappeared.

It will, therefore, in the future be well in all cases of ocular paralysis to know whether they may not be due to an infective process and the consequent formation of toxins which may enter the blood.—*Centralblt. fuer prakt. Augenheilk.*

TATOOING OF THE CORNEA IN ORDER TO IMPROVE THE VISUAL ACUITY.

BY OTTO LANDAU, M.D.

On October 2, 1894, W., aged 28, came to consult me and to see whether the condition of his right eye, which about two months previously had suffered from a vehement and prolonged inflammation, could not be improved. I found the conjunctiva free from any irritation and a large, almost non-translucent, leucoma of the cornea, which was of a rectangular shape and with its irregular and semitransparent edges amply covered the lower three-quarters of the pupil. With its lateral margins it reached the limbus corneæ. At its temporal edge the iris was adherent in one point. The visual acuity was barely $\frac{1}{50}$ for distance, with + 6 D. Sn. $3\frac{1}{2}$ at 4 inches; the visual field and tension were normal. I proposed to tattoo the leucoma and to perform an iridectomy later on, in order to improve the looks and to improve vision by means of the blackening of the leucoma.

On October 9, the leucoma was tattooed in its whole extent in one sitting, the needles being introduced obliquely. Of course the anterior synechia was not interfered with. The patient held so still, that no fixation forceps was needed. After the operation the leucoma was deeply black. Four days later the cornea had healed without irritation, was black, smooth and reflecting well.

On October 30, V. for distance was $\frac{15}{LXX}$ without glasses, that is almost $\frac{1}{5}$ and Sn. $1\frac{1}{2}$ was easily read at 6 or 7 inches.

This considerable improvement of the visual acuity by the tattooing of the leucoma alone, made me abstain from an iridectomy.

The case is closely allied to the one published in the *Deutsche Medicinische Wochenschrift* by my revered teacher and former chief, Prof. Hirschberg and proves that a better visual acuity is obtained by tattooing alone, without iridectomy, if but a very small space of the natural pupil is free.

Furthermore, it seems that the oblique introduction of the needles into the leucoma (which can be done splendidly in one sitting, since the whole field can be overlooked and even the semitransparent edges can be well blackened) is preferable to the methods of Baiardi and Liebrecht, in which a needle is entered under the surface of the cornea and the ink at the same time with it or injected afterwards by means of a Pravatz syringe.—*Centralbl. fuer prakt. Augenhlk.*

SOCIETY PROCEEDINGS.

NEW YORK ACADEMY OF MEDICINE.

SECTION OF OPHTHALMOLOGY AND OTOTOLOGY.

GENERAL MEETING, OCTOBER 18, 1894. D. B. ST. JOHN ROOSA,
M.D., PRESIDENT.

DISCUSSION ON DEFECTIVE VISION IN ITS RELATION TO CRIME.

DR. FRANK VAN FLEET read the paper with this title. See December, 1894, number of this journal.

DR. HENRY DWIGHT CHAPIN.—I have been intensely interested in this paper, which has suggested many lines of thought. The general subject of increase of crime is one of much importance. Some years ago I looked up the subject of increase of insanity and pauperism, and published my results in an article on "The Survival of the Unfit." It was shown there that the criminals, paupers, and insane were increasing out of proportion to the population. The relative importance of heredity and environment has been treated in a novel manner in this paper. I am glad to hear the argument advanced by the author that environment is so much more important than heredity. Heredity is out of our reach, but environment is more or less under our control, so that it is, at any rate, a pleasant doctrine. I am inclined to believe that the influence of heredity has been, at times, over-estimated. My thoughts were first turned in this direction some twelve years ago, when I was put in charge of an institution known as St. Christopher's Home. It had twenty-five little girls, vary-

ing in age from two to ten years. These children had been taken from the poorest tenements, and their parents had come from the worst classes. I devoted considerable time to studying their development and surroundings. For several years there was much sickness in the institution—cutaneous diseases and catarrhal affections. After a while, under improved environment, these affections entirely disappeared. I believe that a vast deal can be accomplished, physically, by securing favorable environment for little children. I am not sure that so much can be done morally. It is not an uncommon experience to find children whose physical well-being has been carefully looked after, nevertheless remain immoral.

Now, in regard to ophthalmia neonatorum—what are we to do with the many cases of this kind seen in dispensary practice? The mother is utterly incapable of looking after such eyes, yet I know of no eye hospital that will take charge of these cases. If we are to save these children from blindness, as we all know we can do by proper treatment, we must make better provision for these poor little ones than exists at present. Some years ago I inspected about twenty public schools, and I found that the primary school children—those who remained the shortest time in school—had the poorest accommodation. The lighting and ventilation of these schoolrooms were very bad. Many of them were lighted by artificial light, and, in addition to this, there were many conflicting lights. If what we have been told about defective vision producing criminals is true, we are likely to have a pretty large criminal class in New York City.

DR. JOSEPH COLLINS.—I differ from the author on very many points. It seems to me that the origin of crime can hardly be satisfactorily divided into physical and moral, for this leaves out entirely the cosmic element, it partly excludes the biological element, and it includes only the social element. It has been proved by students of criminology that the cosmic influences of crime are not to be underestimated. During the winter, crimes against property are common; on the other hand, during the spring and summer, crimes against persons

are common. The reader of the paper has said that education has been asserted to increase crime. Yes, that is, intellectual education, but the education which decreases crime, and which has not been spoken of, is manual education. This is the consensus of opinion of all practical anthropologists; hence, in speaking of education, we should not overlook physical education. If children having criminal antecedents are taught trades and the means of earning their livelihood thus given to them, it is probable that we shall in this way decrease crime, even though they may be slightly handicapped by some slight somatic deficiency. If, however, we attempt to educate their warped intellects we shall probably give them just enough acumen to encourage them to commit crime. It is strange to listen to a paper on crime in which the element of heredity is relegated to the background, without hearing of any of the views brought forward by August Weissmann. It is novel, likewise, to hear reiterated the views advocated many years ago that environment outranked heredity. I think we should not confound acquired characteristics with the phenomena of heredity. Although it is a fact that such procedures as circumcision are followed by the birth of children with foreskins, it is necessary to keep in mind that acquired characteristics are not hereditary, and, carrying out this argument further, we can show that no acquired characteristics are handed down to posterity. Heredity, however, is something much more obscure than this, and to consider it all, it must be approached from the biological standpoint. If crime is due more to environment than to heredity, and we can improve environment, how is it that crime is still on the increase? If, as Superintendent Byrnes says, crime is due to drink, as it is frequently, then I should like to ask if inebriety is not an evidence of heredity. As regards criminals begetting criminals, Superintendent Brynes has reported a number of instances where criminals have endeavored to place their children in the best environment and give them the best education, and yet some of them have become criminals like themselves. The bastard son of Napoleon, notwithstanding the best of environment, was

frequently a fugitive from justice. Why has it become a notorious fact that the sons of the most noble profession very often stray from the path of rectitude?

I would like to ask if the statistics of criminals show that most of them have bad eyes. The instinctive criminal has defective eyes, but has also defective smell, defective taste, and defective sensory conduction. I wish to emphasize the fact that a paper on such a subject should not dispose so hurriedly, and without a proper consideration, of such important factors as heredity and environment.

DR. FREDERICK PETERSON.—I was rather surprised to find so much stress laid on defective vision as a cause of crime. I have been under the impression that most people have defective vision; and, furthermore, although the Arabs and Egyptians are almost uniformly affected with some ocular defect, crime among them is exceedingly rare.

The author has put forward some very radical ideas regarding heredity. I am afraid that Weissmann would be compelled to give up his studies if the views just presented are adopted. It seems to me that there can be no doubt that heredity is infinitely more powerful than environment.

DR. J. E. WEEKS.—Defective vision affects two-thirds of all the human race. In ophthalmic practice, it is quite rare to find a perfect eye. A few days ago I examined the eyes of a young lady, and found them perfect as far as optic principles were concerned; this is the only case I have seen in my office for three or four years where both eyes were optically perfect. It is not surprising that there should be such a percentage of defective vision in inmates of institutions as that mentioned by the writer of the paper.

The mere testing of the ability of more or less illiterate children to read certain type on a card is certainly a very superficial method of examining the vision, and should not be employed to draw important conclusions from. Notwithstanding our increased knowledge of the methods of correcting defective vision, it is stated that crime is on the increase. This should not be if defective vision is an important factor in caus-

ing crime. It has possibly something to do with the production of crime, just as defects of the other senses are related to the production of crime, but, in my opinion, to no greater degree.

If cases of ophthalmia neonatorum were seen at an eye dispensary every day, there would be a very small percentage of blindness from this cause. I do not think that more than two or three per cent of the cases of ophthalmia neonatorum which have been treated as out-patients at the New York Eye and Ear Infirmary have suffered impairment of vision. It is, however, necessary that the children should be seen every day. Under these circumstances, it does not seem necessary to have a special hospital provided especially for such cases.

DR. ROOSA, the President.—I would like to say a few words on the subject of contagious ophthalmia in addition to what has been said by the last speaker. The responsibility for the present condition of affairs should be placed where it belongs—on the officials of the city, for they have refused to erect a special hospital for the care of contagious eye disease. The Manhattan Eye and Ear Infirmary Hospital and the Eye and Ear Infirmary receive all the cases they can possible take care of, but usually daily attendance is sufficient for ophthalmia neonatorum, and the eyes are saved if there is any one at home to carry out the directions. If we received in the hospital all the contagious cases that apply, it would be necessary to stop taking care of cataract, glaucoma, and all operative cases. It is certainly outrageous—for I will use as strong a term as that—that there is no special hospital in the city for contagious eye disease.

DR. VAN FLEET.—I can only repeat what I have said that heredity must sink into insignificance alongside of environment if we look the subject squarely in the face. It seems to me that the opinion of a practical man like Superintendent Byrnes is worth more than that of a theorist, no matter how prominent he may be in the scientific world.—*American Medico-Surgica Bulletin.*

SELECTIONS.

CORTICAL LESION OF THE LEG, SHOULDER AND VISUAL CENTRES OF RIGHT HEMISPHERE.

BY L. R. CULBERTSON, M.D., ZANESVILLE, OHIO.

The subjoined case is one of unusual interest, because of the peculiarity of the paralysis of chiefly the extensors of the leg and arm, and of the visual centre of one eye.

Master J. T. N., aged thirteen years. V., R. E. Rem. unaided= $\frac{1}{3}$, Sn. Ophthalmoscopy shows he requires +.5 D. sp. each eye. Has marked left internal strabismus. Pupils do not react to accommodation, but they do to light, showing cortical lesion. Irides dilate normally to atropine; no synechiæ. Corneæ normal.

Ophthalmoscopic examination: R. E. vitreous, lens and choroid normal. Disc very pale, and shows atrophic cupping. Both arteries and veins too fine; capillaries wanting on disc. Has had strabismus of L. E. since birth, due to paralysis of left sixth nerve. Eyes or body not affected by measles, scarlet fever or whooping-cough.

His father says he never had syphilis, and there is no history of syphilis on either side of the house. Formation of teeth normal, and no enlarged glands, etc. No tuberculosis in family. His father says forceps were not used, and he was not injured about the head at birth. Also has always been defective in strength on the left side. Cannot supinate left hand; cannot touch back of head with fingers of left hand; cannot touch centre of back with left fingers (paralysis of infra-spin-

atus); deltoid normal. Right biceps measures ten and one-half inches, left nine and one-half inches. Infra-spinatus wasted. Right forearm measures nine and one-half inches, left eight and one-half inches. Cannot button coat with left hand; cannot stand on left foot with eyes closed. Left knee-jerk slightly exaggerated, right normal. Cannot flex left foot (posterior muscles affected), and cannot flex toes of this foot; has only partial extension of left foot; extension of left toes normal. Calf, right leg fifteen inches, left fourteen inches.

Esthesiometry: Tip of tongue normal; palmar surface left distal phalanx three lines, right normal; face normal, both sides; great toes normal. All other points normal.

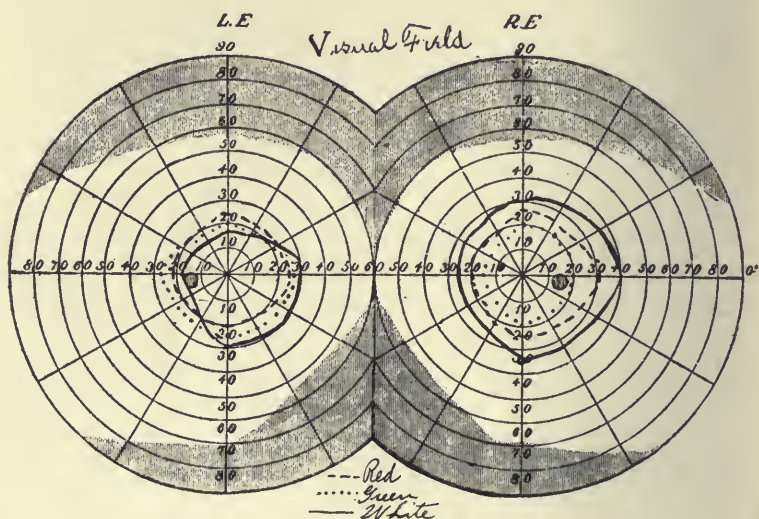
The right side of the head is much smaller than the left. There is very marked difference in development between the two sides of the cranium in the temporal and fronto-parietal regions. Measurements show marked difference in the two sides of the cranium. Boy seems somewhat defective in intellect. When told to do anything he seems to have some difficulty of comprehension. Hearing normal in both ears. Walks in straight line with eyes closed. Writes well with right hand, but cannot write with left (is right-handed). No agraphia, aphasia, amnesia nor alexia. Color vision normal. Pain sense normal; heat sense normal; no nystagmus. Both parents have well-shaped heads. Urine 1020, no albumen, no sugar. Gave strychnia treatment. He never had convulsions or epilepsy.

REMARKS.

We have here a difficult task to diagnose the cause of the lesion of the cortical centres. First, let us investigate the left-sided paralysis. The *essential paralysis (anterior poliomyelitis)* of children comes in infancy, usually during dentition,¹ and the fundus of the eye shows no diagnostic symptom, so far as I can ascertain from ophthalmic literature. Anterior poliomyelitis does not occur before or soon after birth. Two diseases that might cause these symptoms are *chronic hydrocephalus* and

¹Da Costa's "Diagnosis," p. 120.

hypertrophy of the brain. In chronic hydrocephalus, as the disease progresses the head becomes very large, the gait tottering and uncertain. As the malady advances, strabismus, partial palsies, epileptic convulsions, vomiting, loss of sight, anæsthesia, etc., are observed.² Dr. J. S. Ramskill³ says that



in some cases of chronic hydrocephalus the openings between the ventricles become closed, causing the fluids to accumulate more in one part than in another, thus causing unsymmetrical development of the head. My patient does not present the appearance of a hydrocephalic lesion and none of the symptoms save the one-sided enlargement and paralyses. In *hypertrophy of the brain* we find severe headache, stupor, convulsions, palsies, according to the centres pressed upon, and optic neuritis.⁴ My case is lacking in most of these symptoms. His cranium is certainly rachitic, and there may be thickening of the inner table, right side, over the cortical areas of the paral-

²Ibid.

³Reynold's "System of Medicine," p. 837.

⁴Da Costa.

alyzed muscles; yet if it were due to pressure we would expect that at some period of his life he would have had epileptiform convulsions or epilepsy, but he has not. We exclude tumor of the cortex by absence of history of epileptiform seizures and epilepsy. Very careful inquiry fails to elicit any history of a fall or blow on the head.

Summing up all the symptoms and history of the case, the most plausible opinion is that there has been a thickening of the inner table over the cortical area affected, and the absence of epilepsy and epileptiform seizures may be accounted for by the fact that the right half of the cranium is so abnormally large at other points that it, to a certain extent, compensates the pressure over the affected area.

The cortical centres involved, according to Gowers, are the posterior part of the superior frontal convolution, the upper parts of the ascending frontal and ascending parietal convolutions, the upper and anterior part of the superior parietal lobule, and a part of the mesial surface of the brain (all of these the centre of the lower limb); the upper limb centre, *i. e.*, the middle third of ascending frontal and ascending parietal, and the shoulder centre lying in the upper part of this area. Referring to Ferrier's work,⁵ we will see, according to his plate, that centres 2, 3, 4—used in climbing and walking—are affected. These govern some of the muscles of the arm and leg, being situated about the fissure of Rolando. Also parts of the posterior central convolution, *a, b, c, d*, governing movements of the hand and wrist, as in clinching the fist.

We cannot definitely locate the lesion to the sixth nerve. H. R. Swanzy⁶ says "there is no nerve so liable to provide a distant symptom." Gowers refers this liability to the lengthened course these nerves take over the most prominent part of the pons, which renders them readily affected by distant pressure. Prevost⁷ says that "in paralysis of the muscles govern-

⁵"Functions of the Brain," p. 305.

⁶"Bowman Lecture" in British Medical Journal.

⁷Ibid.

ing conjugate deviation the affected eye always looks toward the side of the cerebral lesion." This is true in my case.

In locating the optic lesion, Wernicke's pupil symptom confirms diagnosis of primary cortical lesion. The fact that neither pupil reacts to accommodation, but does to light, might be explained in the same manner as in the case described by Berger and reported by Wernicke,⁸ in which there was blindness of both eyes and both pupils reacted to light. Autopsy showed cortical lesion of one side and disease of optic tract of the opposite side.

So many years have elapsed since the onset of the disease of the eyes that it would be impossible to decide whether the atrophy of the optic nerves is due to pressure on cortical centres, causing a descending optic atrophy, with crossed hemianopsia, and associated with descending neuritis of right optic tract, and later the right and left optic nerves (there is slight haziness about both discs); or whether there has been not only pressure on the cortical visual centres, but also on the right optic tract, causing neuritis of both optic nerves.

It is probable that the primary lesion was cortical, being situated in the inferior parietal lobule, including the supra-marginal convolution and angular gyrus with the subjacent white substance, which can cause hemianopsia with or without other symptoms.⁹ These centres are contiguous to the motor areas affected, and may have been pressed upon or affected by a localized meningitis. This may have been a case of crossed hemianopsia in the beginning, but optic neuritis has changed its hemianopic character. Abercrombie¹⁰ reports a case where injury to vertex caused paralysis of right hand, right leg weak; later clonic spasms of facial muscles, arm and leg, hemianæsthesia, right lateral hemiopia, optic neuritis. Autopsy showed a round-celled sarcoma occupying the (left) occipital and part of the parietal lobe, convolutions of anterior

⁸Loc cit., Bd. iii, p. 335.

⁹Seguin—Archives de Neurology, Vol. xi, 1886, p. 176.

¹⁰Transactions of the Ophthalmological Society of the United Kingdom, 1887.

half of occipital lobe, superior parietal lobule and upper extremity of angular gyrus thinned. The optic neuritis was ascribed to chronic thickening of the meninges at the base of the brain. The concentric contraction of the visual fields was probably due to optic neuritis.

According to Ferrier,¹¹ unilateral destruction of the angular gyrus causes temporary abolition or impairment of vision in the opposite eye not of a hemianopic character. Dr. Gowers¹² says, "numerous observations have established beyond question the fact that hemianopsia results from disease of the occipital lobe, which thus constitutes a centre for the fibres from the same-named half of each retina, and receives impressions from the opposite half of each field of vision. Complete hemianopsia has most frequently been produced by disease of the apex of the lobe, and especially of the cuneus." He believes, however, that, in addition to this half-field visual centre, there is in front of the occipital lobe a higher visual centre, in which the half-fields are combined and the whole opposite field is represented. Such a centre he believes to be localized in the angular gyrus, basing his belief, first, on the cases of "crossed amblyopia," where post-mortem evidence has shown this region to be affected, and also on the experiments recorded by Ferrier. Swanzy¹³ says that, in crossed amblyopia—in which the side away from the lesion is almost blind, with very contracted field, while the field of the other eye is also contracted, but in a less degree—the lesion has been found in the lower and hinder part of the inferior parietal lobule.

"Pathological anatomy leaves no doubt that, in man, the visual centre is situated in the occipital lobe rather than in the angular gyrus and elsewhere, and the evidence goes to show that the absolute optical centre chiefly occupies the cortex of the cuneus, and of the superior occipital convolution, and also especially in respect to the color sense, the posterior part of

¹¹See M. A. Starr's article in *Am. Jour. of Med. Sciences*, 1884.

¹²"A Manual of Diseases of the Nervous System."

¹³"Bowman's Lecture," in *Transactions of the Ophthalmological Society of the United Kingdom*, 1888.

the superior and inferior occipito temporal convolutions."¹⁴ Color vision was not affected in my case.

Ferrier¹⁵ says that bilateral destruction of the angular gyrus and occipital lobe together produces complete and permanent blindness, followed by atrophy of the optic disc and fixity of the pupils, all other sensory faculties and motor powers remaining absolutely unimpaired from first to last. Destruction of the angular gyrus and occipital lobe of the same side produces temporary blindness in the opposite eye, and more or less enduring hemianopsia in both eyes towards the side opposite the lesion. The restoration of vision in this last case Ferrier believes due to incomplete destruction of the centre. This it is extremely difficult to avoid. "After total extirpation of both angular gyri it is doubtful whether complete clearness of vision is ever regained. The occipital lobes, however, can be injured or cut off bodily, almost up to the parieto occipital fissure, on one or both sides simultaneously, without the slightest appreciable impairment of vision."¹⁶ This has been repeatedly verified by Ferrier and Yeo, and confirmed apparently by Horsley and Schäffer, it must for the present at least be accepted. Ferrier amends Charcot's well-known diagram of the optic tracts and visual centres, giving each occipital lobe what we may call a hemiopic relation to the retina, this latter partly by fibres crossing in the chiasma, partly by fibres crossing in the lower visual centres, possibly the corpora quadrigemina."

Haab¹⁷ records two cases, "one observed by Prof. Huguenin, in which homonymous hemianopsia was proved to be due to a lesion situated in the median surface of the right occipital lobe of the cerebrum, close to the posterior limit. Huguenin's case was a girl, aged eight years. Symptoms were dullness of

¹⁴Haab—Monatsbl. f. Augenheilk., 1882, p. 149. Huguenin—Monatsbl. f. Augenheilk., 1882, p. 143. Seguin—Arch. de Neur. l., 1886, p. 176.

¹⁵Ferrier—"The Functions of the Brain," Second Edition, 1886.

¹⁶Ferrier—Second Edition.

¹⁷Haab—Klin. Monatsbl. f. Augenheilkunde, 1882.

intellect, headache, and irritability; enlargement of the head; vomiting, and later, optic neuritis; convulsions, beginning in the facial muscles of both sides, passing to the arms and legs, and followed by unconsciousness for half an hour or so; hemianopsia (right retinæ); no deviation of the eyes, no ptosis, pupils equal and active, no loss of sensation. Diagnosis during life, hydrocephalus of unknown cause; after death a caseous tubercular tumor was found at the apex of the left frontal lobe, occupying the bend of the second frontal convolution, and measuring 2.5 cm. long, 1.76 cm. wide; the second seated directly in the right sulcus hippocampi, in the median surface of the posterior part of the occipital lobe of the cerebrum, and measuring 3 cm. high and 2.5 cm. thick."

Lastly, in closing this article, I will say that the sutures of the skull on the left side may have become prematurely ossified, thereby pressing on the brain, but this theory could hardly hold good, as the symptoms show right-sided cortical lesion.—*Cincinnati Lancet-Clinic.*

A CASE OF HÆMORRHAGIC GLAUCOMA—UNUSUAL HISTORY—A SUGGESTION AS TO WHY SOME CASES OF RETINAL HÆMORRHAGE ARE FOLLOWED BY GLAUCOMA AND OTHERS ARE NOT.

BY JOHN DUNN, M.A., M.D., RICHMOND, VA.,

One of the Surgeons to the Richmond Eye, Ear, Throat and Nose Infirmary; Professor of Diseases of the Ear, Throat and Nose, and Associate Professor of Diseases of the Eye in the University College of Medicine, Richmond, Va.

Within the past few years, I have had under my care three cases of hæmorrhagic glaucoma.

In the *first case*, Mrs. P., aged 68, I removed the eyeball as a primary procedure; the glaucoma was at the time absolute,

and the inner parts of the ball were found to have undergone many inflammatory changes.

In the *second case*, Miss P., aged 65, I attempted an iridectomy which resulted in a dislocation, from sudden relief of tension, of the lens into the anterior chamber; the corneal wound was on the second day enlarged, and the lens allowed to escape; with it came the entire contents of the ball, followed by a profuse hæmorrhage, which did not stop until enucleation was done.

The *third case*, I was fortunate enough to see in the preglaucomatous stage, and to have under my immediate care during the progress of the disease; and as it offered one or two suggestions as to the manner of development of one form of hæmorrhagic glaucoma, I have thought it worth the while to report it.

Mr. P., aged 65. Syphilis in early manhood. A steady drinker for years. Full habit. On February 24, 1894, patient retired to bed in good health. On arising the next morning, he noticed that the sight of his left eye was practically gone. He could distinguish, however, light from darkness. No pain about the eye. No external inflammatory signs. On March 6, he consulted me. Tension of ball normal. Examination showed the fundus of the eye to be the seat of innumerable hæmorrhagic areas of greater or lesser size. They were most numerous and largest about the macula. The region of the optic disc was much swollen; vessels of disc, save for short sections of them, concealed; many hæmorrhages about the swollen disc. The hæmorrhages were less numerous in the outer than central parts of the fundus. Vision, perception of light, and of outlines of objects held peripherally.

O. D. $V=\frac{18}{xvi}$. Fundus is interesting. It is the seat of very numerous deposits, which, although occurring in greatest numbers in the macular region, and in the region just adjacent to the disc, are scattered throughout the fundus. These deposits, more or less circular in form, vary much in size; in places they resemble drops of rain, in other places they are pearly in color; there is no pigment deposit about them; they

occur alone, or in groups covering larger or smaller areas; they cannot be said to follow the lines of the retinal vessels; for, while, in some places, they seem to be ranged on either side of a vessel, they are just as numerous and as large in regions where the retinal vessels cannot be seen with the ophthalmoscope. (Urine normal; heart normal; lungs normal). The optic disc itself presents nothing that would attract attention in an otherwise healthy eye. Perhaps the veins are a trifle dilated, and the arteries somewhat contracted. They are not enough so to attract attention. The seat of these deposits must be the choroid, for a retina with such changes would necessarily show a corresponding diminution in visual acuity. V., in the case of Mr. H. is $\frac{18}{xvi}$, and accurate for both far and near vision.

Mr. H. was given the iodide of potash internally. Hot baths to the eye. Irritation to the skin of the temporal region. Under this treatment, the swollen condition of the disc diminished considerably and there was some absorption of the hæmorrhages.

On March 25, the eyeball began to pain and to be slightly injected about the corneal margin. Incipient glaucoma was suspected, although there was no increased tension. Treatment proved of no avail.

On March 31, the tension of the ball began to get above normal. Eserine (gr. j— $\frac{3}{4}$ j) was ordered to be put into the eye twice daily. It produced such pain that the patient (I was out of town) decided, after the second instillation, to await my return. (And I may say here that in this form of glaucoma eserine is contra-indicated).

On April 2, the eyeball had become slightly painful on pressure; while it was constantly so painful as to cause patient to desist from everything save attention to the eye.

On April 3, the cornea had begun to become cloudy; the fundus could not be made out by the direct method, while the appearance of two small hæmorrhagic spots on the surface of the iris showed, it would seem, that *the iris was diseased*. The

tension was, however, at this time very little above the normal. Pupil not more dilated than its fellow.

April 4. Pilocarpine, gr. $\frac{1}{6}$, twice daily; hot applications to the eyes. Tension normal. Disappearance of the hæmorrhages on surface of the iris. Eyes less painful.

April 5. Pupil irregularly dilated, the lower part of the circle being somewhat flattened, while thrown off from its edge is a small amount of pigment or blood—which, I cannot determine. Tension normal. Ball, however, much injected, and some tendency to œdema of bulbar conjunctiva. Pupil responds less actively to light than in other eye.

April 9. Pilocarpine has been continued. Tension above normal until April 8, when patient was bled from the temple. Conjunctiva remains injected, especially about the cornea. Fundus cannot be made out distinctly. Slight pain on pressure. Eyeball more or less continuously uncomfortable. No further iritic hæmorrhages. Hot applications.

April 16. The symptoms have varied in intensity since above date. General tendency, however, toward increase of the glaucoma. There has been increase in amount and extent of area of deposit along the lower border of the pupil. Marked increase of tension towards night, and with it increase of pericorneal injection. On April 12, put into eye several drops of 4 per cent. solution of cocaine for the purpose of examination of fundus. Pupil dilated irregularly; *dilatation caused appearance of one fairly large and several minute hæmorrhages from surface of iris*. Fundus cannot be made out because of deposit from iris edge on lens, and of some cloudiness of cornea, chiefly in lower half. Eye feels *sore*, and is tender of pressure. On April 14, patient was again bled from temple; tension immediately fell below normal. Anterior chamber deeper than its fellow. Pilocarpine and iodide of potash continued. Eye presents appearance of iritis rather than of glaucoma.

April 24. Condition of eye has changed but slightly. The pericorneal injection is a more fiery red; the tension remains above normal; there have appeared on the surface of the iris numerous hæmorrhagic spots, very small, but distinct.

Pain in ball more or less constant. Some increase in amount of pigment deposit about pupillary margin.

July 15. Hot applications and use of potash continued. The redness has left the eye. The hæmorrhages in the fundus have disappeared, save minute ones here and there—evidently of recent date. The iris is still adherent to the lens along lower part of the pupil. Tension of the ball is slightly plus. There is no pain. Vision has slightly improved. No swelling about nerve.

November 15, 1894. Patient has suffered no inconvenience in O. S. since last examination—in July. Vision has slightly improved—the eye is, however, still useless for the purposes of accurate vision. No hæmorrhages can be made out in the fundus. Pupil attached below at margin to the lens. Tension of eyeball decidedly suspicious.

The above case has several interesting points. We have, as the starting-point of our trouble, choroidal changes present in both eyes. These changes were, in all likelihood, vascular, and resulted in rupture of the vessel walls. One month later, signs of iritic irritation showed themselves, and, with them, signs of glaucoma. A few days later, the high tension was well marked, and the iritic irritation sufficient in degree to cause adhesions between the iris edge and the lens. Slight hæmorrhagic extravasations appeared on the surface of the iris, while even such a mild mydriatic as a weak solution of cocaine caused, in the act of dilatation of the pupil, further iritic hæmorrhages. I think there was at no time a true inflammation of the iris. The interpretation of this sequence of events is, it would seem, that numerous particles of the diseased tissues of the blood-vessels separated, at the time of the hæmorrhages, into the fundus, were carried by the lymph current into the filtration angle, where they lodged, causing obstruction to the lymph outflow—hence the high tension; some of the diseased particles were also carried into the iris tissue—hence its signs of irritation. I think we have, in this case, an indication as to why some cases of retinal hæmorrhage are followed by hæmorrhagic glaucoma, and others are not. Where

the extravasation into the fundus is purely of the blood-elements, there is no likelihood that the absorption of this extravasation will lead to glaucomatous symptoms; where, however, the extravasation consists not only of blood, but of a considerable number of particles of diseased choroidal tissue—in reality, foreign bodies—their removal by the lymph current may produce glaucoma. These particles of diseased tissue reach the filtration angle as emboli, lodge in the minute channels of escape for the fluid from the inner parts of eye, act as irritants to the walls of the lymph channels in which they are lodged, set up an inflammation varying in degree according to the number and character of the emboli and their size, produce, as a result of their irritative action, occlusion of the lymph channels in which they are lodged, and thus arise the symptoms of glaucoma.

The changes noticed in the choroid in the above case may have been amyloid in nature, and the hæmorrhages may have detached numerous minute particles of these diseased areas. Once detached, these particles of diseased tissues would serve as foreign bodies, and then the sequence above noted. I do not mean to say that this is the invariable cause and sequence in the hæmorrhagic glaucoma. The inference from this one case is that hæmorrhagic glaucoma may have such a cause.

The question may be asked: Will this eye finally be lost through glaucoma, so that enucleation will be necessary? At the present time, eight months have passed since the first glaucomatous symptoms were noticed. Mr. H. still retains the eye, which is the source of no inconvenience to him, save such as arises from imperfect sight. Should fresh hæmorrhages occur, it is very likely that further glaucomatous symptoms will appear, and repeated hæmorrhages, accompanied by separation of particles of diseased choroidal tissue, would certainly be followed by fully developed hæmorrhagic glaucoma, with no choice but enucleation.

That enucleation was not a necessity in the case of Mrs. P. must, I think, in a great measure, be attributed to the fact that only a comparatively speaking small amount of diseased

tissue was separated at the time of the hæmorrhages. As for treatment, I believe that the repeated extraction of blood from the temporal region was of far more value than the internal medicines, in keeping the tension of the eyeball within the bounds of possible preservation. I found that the tension would sink to normal, and remain so a considerable time, after two applications of the artificial leech.—*Virginia Medical Monthly.*

RECENT EXPERIENCES IN THE TREATMENT OF DETACHED RETINA, WITH A DETAILED REPORT OF THIRTY-EIGHT CASES.¹

BY CHARLES STEDMAN BULL, M.D., NEW YORK.

The number of cases on which the following conclusions are based is thirty-eight; of these twenty-three were men and fifteen were women.

Their ages ranged from nineteen to seventy-four. There was one case between ten and twenty years; there were six cases between twenty and thirty years; six cases between thirty and forty years; seven cases between forty and fifty years; eleven cases between fifty and sixty years; five cases between sixty and seventy years; and two cases between seventy and eighty years.

The error of refraction present was simple myopia in twenty-two cases; simple myopic astigmatism in one case; simple hypermetropia in six cases; simple hypermetropic astigmatism in one case; compound hypermetropic astigmatism in two cases; and in six cases the refraction was emmetropic.

The detachment of the retina occurred spontaneously in thirty cases, and was due to traumatism in eight cases.

The detachment of the retina was preceded by more or less extensive hæmorrhage into the retina in six cases, and by hæmorrhage into the vitreous in nine cases.

A more or less extensive *laceration* or *tear* in the *retina* was visible in six cases, which allowed a distinct view of the chorioid through the rent.

The intra-ocular *tension* was found normal in fifteen cases; it was subnormal in twenty cases, and increased in three cases.

The *lens* was perfectly transparent in fifteen cases, but in eight of these cases peripheral opacities appeared later. In fifteen cases there were peripheral or nuclear opacities of the lens, or both, as the time of the first examination.

The *vitreous* was generally hazy in twenty-two cases. There were floating opacities in seventeen cases and fixed membranous opacities in fourteen cases.

There was more or less marked degeneration of the *chorioid* with interstitial atrophy in twenty-two cases.

There was *iritis* at some time in the course of the disease in five cases, and acute *chorioiditis* in one case.

The *retina* subsequently became *totally detached* in nine cases, either during the treatment or at a varying period after the treatment had been concluded.

The *lens* subsequently became *entirely opaque* in nineteen cases.

In one case an *extraction* of cataract was made with iridectomy before any treatment was directed toward the relief to the detachment of the retina, and with an excellent result. The wound made in the limbus healed rapidly, the coloboma remained unobstructed, the posterior capsule did not require tearing, and there was no bad effect produced on the detachment of the retina.

In one case an *iridectomy* upward had previously been done by another surgeon without producing any effect upon the detachment.

In one case the eye first affected by the disease, and which had subsequently become entirely blind, was enucleated by another surgeon preparatory to treatment of the disease in the other eye, but without producing any effect upon the condition of the second eye.

All the cases were subjected to the following treatment: The patients were placed on their backs in bed; atropine was instilled in one or both eyes, according to the necessities of

the case, and a bandage was applied to the affected eye, and this treatment was kept up for a period varying from three to eight weeks.

Pilocarpine hydrochlorate was injected hypodermically in daily doses in twenty-five cases, beginning with a minute dose and increasing it to toleration. In a number of these cases the drug produced such unpleasant or alarming symptoms that it was necessary to discontinue it. My experience has taught me that it should not be prescribed in persons suffering from functional or organic cardiac disease.

In those cases in which *pilocarpine* was not borne well, or in those in which it was contraindicated, small doses of *sodium bicarbonate* and *potassium iodide*, largely diluted, were given, the object being to induce free action of the kidneys and bowels.

Corrosive sublimate in small doses was given in the cases complicated by iritis and chorioiditis and in all cases of extensive opacities of the vitreous.

Puncture of the *eyeball* through the sclera into the subretinal space was done in nineteen cases, in every instance subconjunctivally.

Division of membranous bands in the *vitreous* and of the detached retina, thus letting the subretinal fluid out into the vitreous chamber, was done in seven cases.

As regards the results of the above *treatment*, there was a temporary improvement in the vision and in the extent of the detachment, varying from a few weeks to several years, before the vision became reduced and the detachment increased in extent, in twenty-three cases.

There was no improvement whatever in eleven cases.

There was an apparent permanent cure, with entire disappearance of the detachment and restoration of useful vision, in four cases.

There was little or no reaction following puncture of the eyeball through the sclera, or after division of the detached retina and the membranous bands in the vitreous, in any of the cases. This fact I have already noticed in two papers on

"The Surgical Treatment of Membranous Opacities of the Vitreous" previously published, the first one in the *Transactions* of this society for 1888 and the second in the *Ophthalmic Review* for 1890.

Conclusions.—The following brief conclusions seem to be justified by the results of the treatment in the above cases:

1. The science and practice of ophthalmology have as yet discovered no better means for dealing with detachment of the retina than the old methods which have been advised and carried out for so many years—viz., rest on the back in bed, atropine, a bandage and the internal administration of some drug which may induce absorption of the subretinal fluid.

2. The continued use of pilocarpine, either hypodermically or by the mouth, may cause great prostration, even in cases in which it is apparently well borne; and the desired effect may sometimes be produced by small doses of bicarbonate of sodium and iodide of potassium largely diluted with water.

3. In all recent cases puncture of the sclera subconjunctivally may do good temporarily by letting out the subretinal fluid and allowing the retina to collapse, thus producing some improvement in the vision; but the apparent improvement is generally transient, and when membranous bands exist in the vitreous no improvement can be expected from simple puncture.

4. Division of fixed membranous opacities in the vitreous causes but little reaction, and may do positive good even without division of the detached retina, as it reduces the danger of extension of the detachment. It is positively contraindicated in cases where the vitreous opacity is vascularized, as it would certainly induce free hæmorrhage into the vitreous. It should never be done in an irritated or inflamed eye.

5. Division of the detached retina, which allows the subretinal fluid to escape into the vitreous, may always be done in a quiet eye, and causes little or no reaction. If membranous

bands are present in the vitreous, these should also be divided at the same time.

6. In most cases all these operative procedures produce but temporary improvement, and in many cases no effect whatever is gained by them.

7. There seems no good reason for any further indorsement of the method advocated by Schoeler, but every reason for rejecting it from the domain of ophthalmic surgery.—*New York Medical Journal*.

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ORIGINAL ARTICLES.

SOME EXPERIENCES WITH AN ANONYMOUS NEW LOCAL ANÆSTHETIC.

BY ADOLF ALT, M.D.

The experiences made with spurious and less valuable local anæsthetics, by others as well as the writer, soon after the introduction of cocaine into ophthalmic practice, are apt to make us look very doubtfully and suspiciously at everything new being offered in this direction.

Yet, when I received the following letter from one of our most reliable chemical manufacturing houses :

ST. LOUIS, MO., January 3, 1895.

DR. ADOLF ALT, 3036 Locust St., City.—

DEAR SIR.—We have received from a physician in Mexico an extract of a plant which it is claimed possesses anæsthetic and mydriatic properties surpassing cocaine and atropine, and making it a very valuable new remedy for ophthalmological purposes. We are anxious to satisfy ourselves as to the merits

of this new remedy, and if the matter interests you sufficiently to give it a trial, we shall be glad to send you samples, and consider it a great favor if you will report to us your experience with the article.

Kindly let us hear from you, and if you are disposed to give the article a trial, we will send you samples, together with such information as we have regarding its application.

Yours truly, MALLINCKRODT CHEMICAL WORKS.

CH. MALLINCKRODT.

I decided to make the trial once more and so wrote to the firm.

In answer to this I received two small vials containing a dark brown fluid, with a letter, of which I add the parts which are of interest.

ST. LOUIS, MO., January 5, 1895.

DR. ADOLF ALT, 3036 Locust St., City.—

DEAR SIR.—We send you a couple of vials of the extract herewith, and for your guidance in the use of the new remedy, we give you the following extracts from letters received:

"The anæsthesia and mydriasis are both contained in the plant, and act simultaneously, surpassing by far the action of atropine, and equaling cocaine in many respects, and surpassing it in the duration of the anæsthesia, being from two to twelve hours. I have frequently found the ball of the eye anæsthetic at the end of twelve hours. There are no physiological symptoms whatever, and it can be used with impunity on any person of any age. It has many other uses, but it can be demonstrated to be the most valuable drug for ophthalmological practice."

"Drop a little of the extract into the eye, making the patient keep his head back (absolutely no pain or sickness therefrom) so that the drug will remain on the conjunctival membrane for two minutes. You will get the anæsthetic effect in a very few moments; the pupil will be quite dilated in from ten to twenty minutes, then touch or mark the anæsthesia with a

lead pencil or any instrument. On the following day, or twenty-four hours thereafter, have the patient (whose sight has not been in the least affected) come again, and again mark the anæsthetic effect. You will find it just as pronounced, and it will continue from two to four days. You need have no fear of applying it to any eye of any person, *it is absolutely harmless* (we kept it in the eye of a ten-year-old boy for three months straight) and safe, and produces no reflex phenomena *whatever*."

"Two or three drops of the solution should be put into the patient's eye, then, what the eye has not absorbed, can be wiped out, if any happens to remain, in order to restore it to its normal condition. The eye naturally will be a little watery, this is the only disturbance. The sight is in no way affected, and there is no pain. Dilatation will set in from eight to twelve minutes, and in from fifteen to twenty minutes it will be complete."

We shall be obliged if you will give us the results of your experiments, and your opinion as to the value of the new remedy at your early convenience, and are

Yours truly, MALLINCKRODT CHEMICAL WORKS.

CH. MALLINCKRODT.

Accordingly I experimented with this diluted "extract" as furnished me by Messrs. Mallinckrodt on a large number of eyes and for several weeks. The results were very similar in all cases and I, therefore, relate only a few of them.

CASE I.—January 6, 1895. L. B. One drop of "extract" was instilled at 10h. 20m. A. M. This caused very severe pain, hyperæmia of the conjunctiva and lachrymation. The pain was very much complained of. Two minutes later the lower conjunctival sac and the lower parts of the cornea were slightly anæsthetic. At 10h. 29m. The pupil began to dilate, and was half dilated at 10h. 34m. At 10h. 52m. The anæsthesia was much profounder, but not complete even at 11h. 2m. By this time the pupil was widely dilated, but not ad maximum. He

required + 3 D. to read Sn. 1, but stated, that he never could read well with this eye.

January 7, 9 A. M. He stated that the pupil had begun to grow smaller at 2 P. M. on the following day. The cornea was not anæsthetic, but the conjunctiva was quite anæsthetic. The pupil was now medium wide but did not react.

January 8, 9 A. M. The pupil was now almost normal. The anæsthesia of the conjunctiva had remained the same.

January 9, 9 A. M. Pupil still slightly larger than in the other eye. Anæsthesia of conjunctiva still marked, but less than day before.

January 10, 9 A. M. The pupil was normal; there was still some degree of conjunctival anæsthesia.

CASE II.—January 6. Miss R. At 10h. 35m. A. M. I instilled three drops on the cornea which caused very severe pain, injection and lachrymation which lasted the same strength for three minutes and then slowly abated. At 10h. 40m. the lower conjunctival sac was markedly anæsthetic. (The pupil had previously been dilated by means of atropia). At 10h. 49m. I made a second instillation. The lower half of the conjunctiva was then anæsthetic, yet a subconjunctival injection of sublimate upwards caused much more pain than after the instillation of cocaine.

CASE III.—January 6. J. B. At 11h. 7m. I instilled four drops on the cornea of the left eye. The pain was excruciating and there was intense hyperæmia and lachrymation. At 11h. 12m. the pain was gone. At 11h. 43m. the anæsthesia was not complete. There was still very much hyperæmia.

January 7, 10 A. M. The palpebral conjunctiva was quite anæsthetic, the bulbar conjunctiva and cornea much less so. The pupil was medium wide. In this case, as in Case I, the partial anæsthesia of the lower conjunctiva lasted for four days.

CASE IV.—January 6. P. M. Instillation of two drops at 12h. 3m. Pain, hyperæmia and lachrymation as in the other cases. Anæsthesia came on slowly, but was never profound.

January 7, 10 A. M. The conjunctiva is quite anæsthetic, especially downwards. The instillation of two drops of the

"extract" again produced pain lasting for two minutes. In this case the partial anæsthesia did not disappear until the fifth day.

CASE V.—January 7. Mrs. S. Very painful plastic iritis specifica in both. The instillation of two drops into each eye caused the patient to tremble with the pain. While she was in my office the anæsthesia did not get profound; yet, after this instillation she had no more pain and the first night's rest in two weeks. She submitted on the next day with fear to another instillation, but refused on the third day to stand the pain, as she was perfectly comfortable. The anæsthesia, though only partial, lasted for three days.

CASE VI.—January 7. F. W. At 9h. 23m. I instilled four drops on the cornea of the right, healthy and emmetropic eye. Pain, etc., as in other cases. At 9h. 26m. there was partial anæsthesia. At 9h. 35m. the lower conjunctiva was anæsthetic, the cornea, however, still perceived the touch. At 10h. 4m. the pupil was dilated almost at maximum. He now read Sn. 1, with ease. At this time the palpebral conjunctiva was perfectly anæsthetic, the bulbar less so, and the cornea still less. The pupil was observed to begin to contract at 3 P. M., and the patient stated, that till about 6 P. M., he saw as through a veil, when reading closely, showing some interference with the accommodation.

The next day and the day after, the conjunctiva was still partially anæsthetic.

CASE VII.—January 7. J. H. Iritis rheumatica. The instillation of four drops caused enormous pain, injection and lachrymation which stopped after two minutes. Partial anæsthesia six minutes later. On the next day the partial anæsthesia was well marked and it lasted two days longer. During the night he slept without pain and thought he was more comfortable.

CASE VIII.—January 7. S. P. Iritis gummosa. Several instillations were followed by the same symptoms as those in the other cases of iritis. As, in order to test the mydriatic effect of the extract, I ordered the atropine stopped, I found

the next day, that the pupil was smaller and that there was some hypopyon. There was a partial anæsthesia of the conjunctiva which lasted for some days.

I have used this diluted extract in several dozen private as well as clinical cases, but desisted from its further use on account of the truly excruciating pain it produced.

While I made the first experiments the discoverer of this new anæsthetic, Dr. Bray, of Mexico, called on me in person. He was astonished at the pain which the diluted extract produced in my cases and he stated that he never had heard of such complaints. He also left me a sample of the original extract, a sticky, dark-brown, semifluid mass, from which my samples were produced by diluting. He showed me the root and the crushed leaves of the plant from which the extract was said to have been made, and also, left me, a sample of the crushed leaves. From the latter I had an infusion prepared. The application of this infusion caused no pain, but was decidedly less effective, than the extract furnished me.

From the foregoing experiences with the diluted extract as well as the infusion of the crushed leaves, it surely seems that Dr. Bray has discovered a plant with some decided merit as a local anæsthetic and, perhaps, as a mydriatic. It must be kept in mind that the experiment were made with crude material, and undoubtedly the enormous irritation was due to chemical impurities left from the process of making the extract. If I am correct in this, we can only wish that the discoverer will soon be able to isolate the active principles inherent in this anonymous plant and furnish the medical world with the alkaloids. From the experiences made with the extract and infusion we may expect, it seems, that this discovery is likely to furnish us in the near future with a local anæsthetic, whose action is very prolonged. Perhaps, the mydriatic action may also prove of some special value, although in my experiments with the extract and infusion it was not nearly as powerful as that of atropia.

TRANSLATION.

THE SALICYLATE OF SODIUM IN CASES OF EXOPHTHALMIC GOITRE.

BY DR. CHIBRET (CLERMONT-FERRAND).

The oculist can consider Basedow's disease as belonging to his domaine, for he is much more frequently called upon to treat it than others. This affection is one of those against which we find ourselves most frequently unarmed. Therefore, I think, we must gratefully and speedily accept a method of treatment which shows itself to be of a rapid and lasting effect as proven by four cases, which were observed for various periods.

A lady, 44 years of age, presented herself April 15, 1889, with the triad of symptoms: high degree of exophthalmos, goitre, tachycardia. The salicylate of sodium given in the daily quantity of five grammes, divided in four doses, produces a considerable improvement of the symptoms in four days. This improvement persists when the remedy is not discontinued. After five months the patient disappeared from observation.

A farmer, 42 years of age, called March 1, 1890, with the triad of symptoms. The tachycardia is such, that he can neither sleep nor undertake any exercise. Slow walking takes his breath; high degree of asphyxia, profuse sweats. Five grammes of salicylate of sodium given daily in four doses, produce an improvement in six days. This medication being continued, the patient could resume his farm labors at the end of

one month. This result is the more astonishing considering the well-known gravity of the affection in the male.

A lady, 31 years of age, came December 5, 1891, with exophthalmos and tachycardia; a tendency to œdema of the whole right side of the body; slight goitre. In three days the salicylate improved the state of affairs. The remedy being continued, the improvement is upheld. The symptoms returned repeatedly on trying to stop the salicylate. This patient, carefully observed for two years, could leave of the salicylate after one year of treatment. Now, she only takes it in case of emotion, of tiring, of a cold—in one word whenever she feels that she is threatened by the return of the pathological symptoms, because her general condition is less satisfactory.

A lady, 40 years of age, presented herself in January, 1891, with the three symptoms. Her condition was at once improved by the salicylate. Continued as in the former case, it gave the same good results, in spite of a life full of worry and apt to produce an aggravation.

The course of Basedow's disease, with its progressive attacks and its periods of quiet is very similar to that of gout. It is, moreover, possible sometimes to establish a former arthritis in patients affected with exophthalmic goitre, when inquiring into their acquired or hereditary pathological antecedents. These facts have led me to the treatment with the salicylate of sodium. The result has amply confirmed the exactness of my ideas and I hardly know of any arthritic manifestations in which the effects of the salicylate of sodium are equally evident.

Unfortunately my observations are limited to four sufficiently studied cases. Nevertheless, I did not think that I should defer their publication any longer, because they are old enough, and sufficiently significant to produce conviction. The scarcity of the affection, moreover, might force me to defer the publication indefinitely, if I waited till I had a sufficiently large series.

In conclusion I want to say, that in the pronounced cases I have found a great repugnance against the medication. The

salicylate of sodium enjoys a bad reputation among the public. Badly administered or badly taken in certain cases, it has given rise to symptoms which those who have experienced them will hardly pardon.

I, also, recommend to administer it in four doses in the twenty-four hours and at least in half a quart of fluid. Under such conditions the symptoms it produces are very bearable, even in cases of intolerance. Furthermore, the quantity of five grammes may be reduced to two or four, if the patient continues to complain of it and threatens to abandon its use. With a quantity of two grammes I have never seen the least intolerance.—*Revue Générale d'Ophth.*

SOCIETY PROCEEDINGS.

CHICAGO OPHTHALMOLOGICAL AND OTOLOGICAL SOCIETY.

Regular meeting, postponed one week, held at the Saratoga Hotel, Jan. 15 to 18, 1895. DR. HOTZ in the chair.

There were twenty-four members in attendance.

The Treasurer's report showed a balance of \$60, Jan. 1 1895. This was ordered audited by a committee consisting of Drs. Westcott and Starkey.

The following officers were elected for the ensuing year:

President—Dr. F. C. Hotz.

Vice-President—Dr. H. Gradle.

Secretary—Dr. C. P. Pinckard.

Committee on Membership—Drs. W. H. Wilder, E. L. Holmes, G. F. Fiske.

Dr. W. E. Gamble was elected a member.

On motion, the Secretary was instructed to provide a ballot box.

On Dr. Gradle's motion, it was voted that the Society set apart certain evenings for discussion of stated topics, such topics to be announced at the preceding meeting.

DR. TILLEY reported three cases of "asthenopia," relieved by crossed cylinders of equal strength. Efforts had been made in each case to relieve the condition by spherical lenses, by cylinders and by combinations of both. In every case there was a considerable amount of astigmatism as seen by the ophthalmometer, but in no case could the patient's vision be improved by astigmatic correction. First case seen in September, 1894. Repeated trials were made with spherocylinders

to relieve the asthenopia but without success. On trying a -2.00 D. axis $180^\circ \subset -2.00$ D. axis 90° , the patient read $\frac{6}{VI}$ easily. After repeating the test several times, glasses were ordered and patient has been comfortable since. Second case was a lady about 45; had never seen with comfort, wearing $+5$ D. With $+2.50$ axis $90^\circ \subset +2.50$ axis 180° vision rose from $\frac{6}{XVIII}$ to $\frac{6}{VI}$. These were worn a week with comfort, and then $+4.50$ axis $60^\circ \subset +4.50$ axis 180° was ordered for near. She has been using them with comfort ever since. Third case, vision was raised from $\frac{6}{XII}$ to $\frac{6}{V}$ by $-.50$ axis $90^\circ \subset -.50$ axis 180° , and asthenopia relieved. Samples of crossed cylinders, ground by F. A. Hardy & Co., were shown.

DR. HOLMES had had a similar experience with a cataract case.

DR. STARKEY had tried such combinations but not with much success. He had seen cylinders with axes not at right angles give relief.

DR. GRADLE referred to articles by Mauthner and by Channing where cylinders crossed had given relief.

DR. HOTZ referred to the fact that in mixed astigmatism crossed cylinders were better than sphero-cylinders. The field is said to be flatter and there is less spherical aberration.

DR. TILLEY had seen a patient wearing $+9$. axis 90° combined with -8 . axis 180° .

DR. WILLIAMS showed Snellen's modification of Donders' instrument for measuring the color sense quantitatively. The essential feature is that the illumination as well as the size of aperture can be accurately varied. The trouble is that a different normal standard should be made for each color.

DR. HOTZ then spoke about the theory of the symmetric action of the oblique muscles in oblique astigmatism, so persistently advocated by Dr. Savage. He showed that Dr. Savage has given us no proof of the existence of such action of the muscles. Dr. Hotz has never been able to find such action in any case of oblique astigmatism and denied that the supposed rotation of the eyeballs caused by this action would benefit binocular vision. He further proved by demonstrations

that oblique astigmatism does not cause obliquity of the retinal images and showed that the laws of physiologic optics do not sustain such doctrine. The theory is based on false premises and wholly untenable.

C. P. PINCKARD, Secretary.

NEW YORK NEUROLOGICAL SOCIETY.

JANUARY 8, 1895.

TUMOR OF THE OPTIC THALAMUS, AUTOPSY.

DR. EDWARD D. FISHER.—The patient was a woman, age 25 years, who had always enjoyed good health. She had two children, both healthy. Her family history was negative, with the exception that her father died of so-called softening of the brain, and that in several members of the family there was exophthalmus, but no other symptoms of Grave's disease. During her first confinement there was marked enlargement of the thyroid gland, which, however, subsided. Following her second pregnancy the thyroid again enlarged, which proved permanent, at no time, however, was there any rapidity of the pulse.

The patient first complained of severe headaches in April, 1894. At that time her eyes were examined, but no changes were observed in the optic discs. The pain in the head was excessive, especially in the morning, and was located on the right side and posteriorly. The patient was somewhat stupid. Her speech was unaffected. The pupil of the left eye was dilated, but reacted normally to light. Her vision was unimpaired. There was slight left paresis of the face; the tongue did not deviate; taste was normal. The thyroid gland was enlarged on the right side. The left arm and hand showed

marked weakness. There was pronounced ataxia. Sensation was much diminished and impaired as to touch and pain. She was unable to differentiate between heat and cold. The lower extremities were not affected. There was no vomiting nor convulsions; the pulse varied from 65 to 70 per minute; the temperature between 97.5 and 98.5°. Her condition continued to grow worse, and the headaches persisted.

On July 21, 1894, when Dr. Fisher first saw the patient in consultation with Dr. Julius Rosenburg, there was marked paresis of the left side, with flaccidity and diminished reflexes. The sensory condition showed generally reduced response to all tests. The mental condition was somewhat affected, the patient appearing to be hysterical; this, in conjunction with the flaccid paralysis and the complete dragging of the foot on walking, made a diagnosis of hysteria probable. The paralysis, headache and mental stupor gradually increased and the sight began to fail. On August 31 an examination of the eyes made by Dr. Carl Koller revealed left hemianopsia and choked disc, and paralysis of the left abducens muscle. A diagnosis was then made of tumor at the base of the brain, involving the right crura cerebri above the third nerve, and compressing the right optic tract. On September 12, blindness was complete, with optic atrophy. The motor and sensory symptoms on the paralyzed side remained unchanged. The patient was subject to hallucinations of sight and hearing. The diagnosis of tumor involving the optic thalamus was now made. The patient went into a condition of coma and died on September 16. At the autopsy a large vascular tumor, the seat of a recent hæmorrhage, was found involving the right optic thalamus and compressing by its extension downwards the optic tract on that side; the growth proved to be a glioma.

SELECTIONS.

THREE VARIETIES OF EPIPHORA.

BY G. E. DE SCHWEINITZ, M.D.

Professor of Ophthalmology in the Philadelphia Polyclinic.

A LECTURE DELIVERED AT THE POLYCLINIC HOSPITAL.

GENTLEMEN.—Probably most of the cases of epiphora, except the great group due to inflammatory or obstructive disease in the puncta lachrymalia, canaliculi, lachrymal sac or its duct, to which I shall make no special reference this afternoon, could be gathered in one of the three classes presently to be described; although it is manifestly impossible always to separate those which arise from anomalies in the lachrymal apparatus itself from those which have an intranasal or conjunctival origin.

THE EPIPHORA OF REFRACTIVE ERROR.—This may be caused by any anomaly of refraction; but is especially frequent in patients nearing the presbyopic age who are disinclined to accept the required optic aid, and in moderate grades of astigmatism, both with and without headache, or other well-marked astigmatic phenomena. If imperfect muscle balance, especially exophoria, exists, there is an additional exciting cause of the overflow of tears partaking somewhat of the nature of a mechanical factor, because under these circumstances it is not uncommon to find a patch of coarse congestion over the internal rectus muscle, slight œdema of the plica and swelling of the caruncle, all of which interfere directly with the anatomico-physiologic function of the punctum.

The overflow of tears usually occurs in one of two ways: As soon as near work is begun, or shortly after its commencement, "the eyes fill with tears," and must be dried before the work can be pursued, or suddenly there will be a gush of tears followed by an apparent relief of a preceding sense of strain. Sometimes, however, the eyes are used with comparatively little local discomfort; but when they are exposed to wind, or even only to cold air, epiphora at once becomes manifest. This leads to the belief that there must be some local obstruction, and in one sense there is, because the eye-strain has probably created either a moderate congestion in the regions before named or a tendency to congestion requiring some exciting cause to bring it into active existence, and this is supplied by the wind or the cold air. Be this as it may, many cases of epiphora are cured entirely by the correction of the refractive defect without local treatment of the conjunctiva, punctum or ductus ad nasum. Therefore, this rule should be followed in every case of simple epiphora: Thoroughly investigate the refractive condition of the eyes and correct it if anomalous.

THE EPIPHORA OF INTRANASAL ORIGIN may be divided into excessive lachrymation caused by irritation of the mucous membrane, and obstructive epiphora, or an overflow of tears due to a mechanic interference.

Dr. Ralph W. Seiss¹ writes thus in regard to the first type: "What I understand by simple epiphora is most common in severe acute coryza, acute vaso-motor rhinitis, including all forms of 'hay fever,' and in certain irritable cases of hypertrophic rhinitis. In some cases of sclerotic and atrophic nasal catarrh it follows crust irritation; but in these diseases the epiphora is more apt to be due to acute obstruction from fibroid changes."

Dr. S. MacCuen Smith,² referring to the same point, makes use of almost exactly similar language, and points out how repeated attacks of acute rhinitis may cause a chronic thickening of the mucous membrane, which, in its turn, is responsible for the obstructive variety of the disorder.

¹ & ²Personal communications.

The second type presents more important features. Dr. Harrison Allen³ in 1890 wrote thus: "The anterior end of the middle turbinated body, either by displacement of the bone or by hyperplasia of the mucous membrane, can make injurious pressure against the lachrymal bone, and thereby create a congestive state of the lachrymal tube which leads to obstruction." This opinion Dr. Allen still holds, and he further states⁴ that patients exhibiting ethmoid bones which are wide anteriorly, namely, where they lie opposite the ascending process of the maxilla, are those most liable to suffer from narrowing of the ductus ad nasum.

Dr. Walter J. Freeman⁵ believes that enlargement of the inferior turbinal, whatever its character, is the cause of most cases of epiphora. At times it takes the form of a small local hypertrophy pressing against the outer wall, only to be discovered by careful examination. Next in frequency are pronounced deviations and spurs of the septum. The spur itself may not obstruct the nasal duct, but it either presses the turbinal over against the outer wall or prevents the erectile tissue of the turbinal from expanding toward the median line, so that it necessarily expands in other directions—downward, upward and outward—and if in the last-named direction, obstruction is created.

Dr. S. MacCuen Smith,⁶ after detailing the various obstructive intranasal lesions which have already been referred to, and pointing out the relation of atrophy of the mucous membrane, cicatricial contraction following ulceration and necrotic condition of the nasal bone as organic sources of epiphora, dwells particularly upon the affection known as granular pharyngitis, especially when this leads to subsequent atrophic changes, as an initial lesion that may result in future obstruction to the passage of tears through the nasal duct, leading thus to overflow.

³Proceedings of the Philadelphia County Medical Society, Vol. II, p. 52, 1890.

⁴ & ⁵Personal communications.

⁶Personal communication before referred to.

Some time ago I analyzed a number of cases of disease of the lachrymal passages presenting themselves for treatment in the Eye Department of the Philadelphia Polyclinic, and pointed out their intimate association with intranasal lesions,⁷ the conditions described in the preceding paragraphs being more or less constantly present.

The second rule, then, evidently is this: The rational management of certain types of epiphora must include thorough intranasal examination and treatment.

THE EPIPHORA OF NERVOUS DISORDERS.—It is common enough to find epiphora in neurasthenic and hysteric patients, sometimes because of some of the well-known conditions which are responsible for this phenomenon, and sometimes as an integral portion of the symptom-complex of these disorders. Indeed, Petrolucci,⁸ who has recorded the literature of this subject, and who describes a number of cases of epiphora the cause of which resides in some general disease, refers especially to hysteria and allied conditions. He further points out that in this list of diseases locomotor ataxia should take a prominent rank, and to this symptom of tabes I desire for a moment, in concluding, to call your attention. Berger⁹ has seen it unilateral three times in 106 cases and fifty times altogether, that is in about half of his patients. The bilateral cases were as follows: Nine times in the preataxic stage, twenty-three times in the ataxic stage, and fifteen times in the paralytic stage. Therefore the epiphora increases in frequency from the beginning of tabes to the ataxic period, while in the paralytic stage it is relatively about as frequent in the ataxic stadium. Certainly, since reading Berger's paper, and perhaps for a longer period, I have examined every ataxic for this symptom, and while unable to confirm the statement that well-marked epiphora is present in fully fifty per cent. of the cases, it is a

⁷Proceedings of the Philadelphia County Medical Society, March 23, 1892.

⁸Thèse de Montpellier, 1886. Abstract Nagel's Jahresbericht f. Ophthalmologie, Vol. XVII, p. 300.

⁹Archives of Ophthalmology, Vol. XIX, p. 444.

definite symptom in a number of instances. One difficulty in estimating the frequency of epiphora in ataxic cases is the elimination of other factors which are active in its etiology, and this has not always been done in the recorded examinations.

In all probability the epiphora is due to weakness of the orbicularis, this interfering with the proper relation of the punctum to the eyeball. This is a prominent feature, as you well know, in cases of facial palsy; indeed, it may be an early symptom, and is caused partly by the loss of the compressing power of the lid, especially in the fibers of Horner's muscle, and partly by the falling away of the punctum. The intimate relationship of the oculo-facial group of muscles to the nucleus of the third nerve (Mendel's hypothesis) on the one hand, and on the other, the frequency of disturbance in this nucleus in tabes, may afford an explanation of the weakness of the orbicularis which is common in this disease.

It is possible, however, according to Berger, that hypersecretion may have etiologic importance, and he thinks that this has its analogy in the hyperidrosis of the face—an accompanying symptom of the vaso-motor neurosis in tabes.

Evidently a third rule is: Epiphora, otherwise unexplained, may have a significance from the neurologic standpoint, and should be so investigated.

TWO CASES OF SYPHILIS OF THE EYE.

BY HOWARD F. HANSELL, M.D.

Adjunct Professor of Diseases of the Eye in the Philadelphia Polyclinic; Chief
Clinical Assistant in Ophthalmology, Jefferson Medical College
Hospital; Etc.

CASE I.—GUMMATA OF THE CONJUNCTIVA.—G. K., colored man, 31 years of age; admitted having had the initial lesion ten years ago, and various secondary manifestations since. During the past few years his habits have been extremely bad. He applied at the Eye Clinic of the Jefferson Hospital on account of inflammation of the right eye of one week's duration. The conjunctiva was uniformly hyperæmic, and to the outer side of, and just bordering on, the corneal margin, where seen two irregularly outlined patches, detached from each other, whitish gray in color. The larger measured about one cm. in diameter, the smaller somewhat less. The edges were sharply outlined from the conjunctiva, the color abruptly changing from the deep red of the congested, but otherwise unaltered mucous membrane, to the gray of the infiltration. The surfaces were on the level of the conjunctiva or very slightly elevated, rough from deposits and from loss of epithelium, and resembled in color and surface the corneo-scleral border in vernal catarrh. There was no pain, photophobia, lachrymation or mucous discharge and no evident constitutional disturbance.

The patient was treated by Prof. Orville Horwitz in the Venereal Clinic, by hypodermatic injections, in the muscles of the back, of $\frac{1}{4}$ grain of mercury bichlorid, daily for ten consecutive days and no other constitutional or local treatment. At the end of this time the gummata had entirely disappeared. Two weeks later, a relapse occurring, an injection of the same quantity was made on each of two consecutive days. The disease again disappeared but whether permanently or not cannot be recorded since the patient failed to report.

CASE II.—RELAPSING AND ALTERNATING ACUTE OPTIC NEURITIS.—J. J., aged 43; unmarried, had a chancre in 1872, followed by ill-defined secondary symptoms, for which he received inadequate treatment. His occupations, horse dealer, hotel keeper, gambler, prospector, brought him into contact with vice, self-indulgence and licentiousness of all kinds, but he has, according to his own statements and my almost daily observation during more than three months, led a temperate life in all respects. In November 1893 he says he had a soft chancre, without constitutional infection unless the symptoms I am about to describe may be classified under the manifestations of secondary syphilis. During the winter of 1893-1894, J. was under treatment in two or three different cities for syphilitic sore mouth (his own statement). At the time he came under my care, March, 1894, several patches on the buccal mucous membrane, including the tongue, were strongly suggestive of the mucous patches of secondary syphilis. He had been taking continuously for some weeks different preparations of the mercury salts and was decidedly ptyalised. The gums were inflamed and swollen, the teeth tender and the breath heavy with the odor peculiar to mercury. It is not unlikely that mercury had as much to do as syphilis, with the production of the sore mouth. For the past few days J. had noticed with alarm a rapid diminution of V. of the *right* eye, without pain. Examination showed optic neuritis of moderate grade, the eye otherwise normal. V. reduced to counting fingers at the periphery, absolute central scotoma measuring 20 degrees toward the nasal, and 10 degrees toward the other quadrants of the field. V. of the left eye $20/_{xx}$ and the eye normal in every respect.

He was ordered potassium iodide in increasing doses, beginning with sixty grains daily, until, on the fourth day, he was taking two hundred and ten grains. A larger dose than this was not well borne. V. commenced to improve on the third day and reached full acuity in three weeks. His respite was brief, for in less than a week, during which the iodide had been intermitted, he complained of exactly similar loss of sight

in the *left* eye. It did not advance quite to the degree of blindness, nor was the scotoma as large or as complete. The disc seemed to be equally swollen and, in addition, *both* irides and ciliary bodies became inflamed. Fearing the evil consequences of exposure to the weather I confined him to the ward of the Polyclinic Hospital for ten days, and ordered hot water and atropine locally and two hundred grains of iodide in each twenty-four hours. Under this treatment the iritis subsided, the disc cleared up and V. returned to its normal acuity. The patient again became careless about taking his medicine and had a relapse in the right—the eye first affected—V. going down to $^{20}/_{cc}$ with an illdefined central scotoma. He no sooner recovered from this attack than the phenomenon recurred in the left. While under my observation he had three attacks of partial loss of V., central scotoma and optic neuritis, each of less intensity than the preceding one, occurring during cessation of treatment and cured by a return to the administration of two hundred grains of potassium iodide daily. On July 1, the date of his visit V. equalled $^{20}/_{xx}$ in each eye. On that date he started for South Africa and since his arrival I have heard that his sight remained unimpaired.

This case offers several points of interest: the cause, upon which a reasonable doubt may be cast; the acute rising and setting, and alteration from one to the other eye; the utter worthlessness of mercury in this particular case and the wonderful efficacy of potassium iodide when freely exhibited; the recurring optic neuritis, never double but always nearly so; the repeated central scotoma, and the restoration of full acuity of V.

The case is unique in my experience. The ultimate cause was undoubtedly syphilis, but whether a tertiary or a retarded secondary manifestation is uncertain. The immediate cause was probably a retro-bulbar neuritis along the course of the foveal fibers. Meningitis, cerebral tumor, basal softening or gummatous disease back of the chiasm, can safely be excluded.—*Philadelphia Polyclinic.*

THE GROWTH OF OPHTHALMOLOGY, AND THE WAYS IN WHICH THE EYE FAILS TO MEET MODERN REQUIREMENTS.

BY EDWARD JACOBSON, A.M., M.D.,

Professor of Diseases of the Eye in the Philadelphia Polyclinic; Surgeon to Will's
Eye Hospital, Etc.

The recent development of ophthalmology as a special branch of practice has frequently been regarded as too rapid to be healthy and permanent. It is naturally thought that if the eyes are so defective that a majority of them require the aid of glasses, why has not the fact been discovered before. An easy explanation which offers itself to the mind of both physician and layman is that we have here an instance of what is not known in other branches of practice—a sort of fad or temporary fashion—that is regarded as the proper thing just at present to have trouble with one's eyes, and a mania for consulting oculists and employing opticians. The knowing ones are quite ready to insinuate that the fashion will soon pass away, that some other fad will be taken up, and that then the oculist will have to turn his attention in some other direction.

This view of the case could not be entertained by any one who saw the real need for optical assistance felt by the mass of patients who came to the ophthalmic surgeon. It can only have sprung up where there is ignorance of the real capacity of the eye for labor, and lack of appreciation of the requirements which are now made of it by a large part of the community. The mass of persons using their eyes have no rational

idea of how to use them to the best advantage, or of what limits to place on their requirements of the organs of vision.

To understand why the eye so frequently fails to meet the requirements made of it, you must glance at the conditions determining its evolution. Among medical men, as among other students of biological science, it is to-day generally admitted that the adaptation of the different organs, each to its special function, has been brought about by the process of gradual development through the inheritance of such variations as better fit the organs for its purpose, and the extinction of such as would render it less valuable to its possessor. By this process the eye is gradually fitted, and to a wonderful degree, to the requirements made of it. But the process is a very slow one, it has occupied many thousands of years for even its latter stages. The variations occurring in two or three, or a score, of generations have been comparatively slight and unimportant. During the whole of this period from so far as we can follow back the history of our ancestors, until what may be spoken of as the immediate present, the conditions of human life have been substantially the same as regards the requirements made of the eye.

The eye as we have it to-day, has been developed to meet the requirements of savage life. The conditions of living have, in this respect, continued the same down to within a very few generations. In savage life the essential requirements is distinctness of distant vision, the main objects of the savage being to avoid his enemies by perceiving them at the earliest possible moment; and to discover what would serve as food at the greatest possible distance, and before it could escape him or be snatched away. To the savage near-sightedness would be almost as great a calamity as complete blindness. For purposes of accurate distant vision the myope must be entirely dependent on others. His existence in a society where mutual dependence of its members is not recognized would be impossible. Now the eye in its evolution like every other organ of the body has approached a certain standard of form and proportion, from which however it varies appreciably in

nearly every case. There are variations in the form of the eye, as numerous as there are individuals who possess eyes. The optical perfection of the eye depends entirely on the form and proportion of certain of its surfaces. Under such conditions it would be inconceivable that optical perfection should be generally or even frequently attained. The sculptor and painter recognize the difficulty in obtaining a perfect model of any portion of the human form. This being the case, the safety of its possessor depended on the variation in the form of the eye being in that direction which should still allow a perfect distant vision. Hence in the savage life, and among civilized people, except as disease has changed it, far-sightedness is the almost universal rule; and the myópic or near-sighted eye the marked exception.

With civilization comes a complete change in the requirements that a very large proportion of the community make of their organs of their vision. The hunter and warrior become comparatively unimportant members of society, and correspondingly diminish in numbers. The occupations that replace theirs are most of them such as require distinct vision at comparatively short distances; and this movement toward enlarged requirements for near seeing has increased with great rapidity within the last generation or two. If one takes the list of occupations filled by the inhabitants of a city and runs them over, he will be astonished how many of them have come into existence, as occupations claiming the entire attention of any considerable number of people, within the last generation. And even with those forms of work which have come down more remote periods requiring close application of the eye, the number to-day engaged in them is enormously greater as compared, with the whole community, than it was two or three generations back.

Almost the whole of the so-called labor-saving machines, while enabling the hands to accomplish enormously more than they could have done without them, have to almost the same extent increased the labor of the eyes. The scheme of affording a common school education to every member of the com-

munity has been put in operation within two generations. The growth of the practice of reading is phenomenal. In my own recollection at the outbreak of our civil war the person who took a daily newspaper was regarded as indulging in an unusual and peculiar form of luxury; and the daily paper that had a circulation of ten thousand copies occupied very much the same position as the paper of to-day that numbers its readers by the million. During the same period there has been an increase in the amount of printed matter furnished in each of these daily papers quite as great as the increase in the number. Other forms of popular literature have chiefly come into existence in the same period; and at the same time the popular ignorance upon this subject of the limitations of the power of vision has allowed or encouraged the distinct determination of the type and press work employed for a very large proportion of both books and newspapers.

Here then we have the eye shaped by a long slow process of evolution for prolonged distinct distant vision, and brief periods of near seeing; and when so developed, suddenly applied to continuous and difficult near vision. The growth of modern ophthalmology and frequency of eye-strain are largely expressions of the fact that the human eye is imperfectly adapted to continuous near vision. As expressions of such a fact they are real; and to a large degree permanent, at least for the generations that will be required to adapt to each other the eye and the requirements of the new conditions. The hyperopic eye is a serious handicap to any one compelled to spend his days in close looking, and in proportion to the amount of its farsightedness is its liability to give way and require outside help for the performance of its duty.

It might be supposed that the opposite of the hyperopic, the myopic eye, would be correspondingly advantageous for near seeing; and so it might if we had to consider a myopic eye resulting from a prolonged process of evolution, and fitted thus to exactly the work it was required to perform. But the myopia existing in a civilized community is something entirely distinct from this in its origin. It can scarcely be regarded as

at all an adaptation of the eye to its work. But rather it is a form of deterioration produced by an unnatural position, just as is a spinal curvature. If you will recall for a moment the relations of the recti muscles in the orbit, you will see that arising from the apex of the orbit they pass forward and enclose the eyeball, forming, when taken together, a cone, with the eyeball enclosed in its base. Any increased tension of these muscles necessarily causes an increased pressure upon the eyeball, but not on its whole surface. The anterior portion, including the cornea and ciliary region, and the posterior portion of the eye escape. The pressure is applied on the zone between them. This pressure has then a tendency to change the shape of the eyeball from that of a comparatively perfect sphere to that of an oval or oblong spheroid, it tends to cause the elongation of the globe antero-posteriorly and to change the form, necessarily causing myopia.

While it is probable that the possibility of a myope living and competing successfully with others in civilized society has somewhat increased the number of myopic eyes through inheritance, it still remains a fact that myopia as the ophthalmic surgeon encounters it, is a pathological condition and not an adaptation of the eye to existing conditions. As a pathological condition it becomes the subject of medical and surgical supervision and care as properly as any other condition that we are called upon to treat; and since the causes of this particular condition have suddenly become so prevalent, it certainly is not necessary to invoke the fad theory to explain why there are more cases that require treatment.

While deterioration at the posterior pole of the eyeball causes myopia, change of shape in the cornea, brought about in some cases by the same mechanical pressure on the globe, causes the optical imperfection of the eye known as astigmatism. I know that this defect heretofore has been regarded as chiefly congenital; and to a large extent it undoubtedly is. It seems that to the eye of the savage a slight difference in the refraction of the vertical and horizontal meridians is not any great disadvantage. It probably is something of an aid in at-

tracting his attention to slight breaks in the line of the horizon, such as would be caused by the presence of a large animal or a man. To the sailor, too, it may be in the same way some slight advantage, but to the writer, the student, the clerk, the sewing woman, the fine mechanical worker, it is an unmitigated evil. Whether it comes by inheritance, or from the strain of the eye, or disease, in such persons it requires correction. So much of the optical defects, that have afforded so much of the work of the ophthalmologist, is the need for their correction by lenses.

Within the last few years a new class of troubles has sprung into existence, the so-called *muscular anomalies*. While I think that our knowledge of this department of ophthalmology is not yet sufficient to enable us to decide to what extent they are causes of trouble and to what extent only symptoms, it is clear that their existence as defects of practical interest is due to the same set of causes, the same changes in the requirements made of the eye, that have been indicated as underlying defects of focus. The continuous fixation of the eyes upon a near object or their rythmical excursion from side to side in reading, or in following the work of certain kinds of machines constitutes a state of requirements of the ocular muscles totally unknown to the masses of savage races.

I have thus far spoken of ocular conditions alone; but any one who knows anything of ophthalmology knows that its practice has to deal largely with the relief of symptoms outside of the eyes—manifested through any and all portions of the nervous system. If we realize that the eye has been subjected to a strain to which it was quite unfitted, although it has an elaborate provision for meeting even these requirements—if we remember that the enormous mass of nerve tissue constituting the human brain represents the enlarged ganglia of certain nerves of the cerebro-spinal system, namely the so-called cerebral nerves, and that six out of the twelve of these cerebral nerves are distributed partly or wholly to the eyeball or its accessory apparatus, we will begin to appreciate the necessity that over strain of the eye should cause the most se-

rious disturbances in the balance of the whole nervous system. And we will have sufficient explanation, without invoking fashion or fancy, of the connection between the eye defects and such symptoms as headache, vertigo, neurasthenia, hysteria, even visceral neuroses and grave motor disturbances.

It may be said that while for the great mass of the community, the change in the requirements of the eye is as sudden as has been indicated, that for many hundreds of years there has been a certain small part of our race making similar requirements of their organs of vision; that in the schools and monasteries of mediæval Europe a certain number of students were thus taxing the powers of these organs. This is quite true, but it is one of those exceptions which merely adds force to our deduction from the more general life of the community. Probably no equal number of individuals anywhere has presented more cases of suffering from eye-strain, impaired vision and partial or total blindness. Tradition tells us of the blindness of Homer, certain it is that Milton lost his sight by abuse of his eyes, Pepys laid aside his charming diaries with the utmost regret because his hyperopic eyes were no longer equal to the demands of writing, and Euler sacrificed one eye to complete, in three days, mathematical demonstrations that would ordinarily take weeks; and lost the other a few years later by his continued devotion to his studies.

There has only been time to speak this evening of this one reason for the growth of modern ophthalmology. Of the other reasons—the discovery of the ophthalmoscope, carrying this branch of medical science to a refinement and exactness, thus far unapproached by any other department of medicine; the wonderfully intimate knowledge attained through this instrument by the inspection of the living circulation, and the living nerves, and the importance of the evidence which the ocular circulation and nerves give of the general condition of these systems throughout the body, have also been most important influences in determining this development. To do them justice would require not only a separate evening but many evenings. I hope only to have demonstrated that oph-

thalmology as a branch of medical practice has come into existence not in obedience to the whim of fashion or a systematic attempt to impose an unnecessary service on the long suffering community, but to meet real needs arising from the general tendency and movement of our civilization.—*Gross Medical College Bulletin.*

EYE-STRAIN A CAUSE OF NOCTURNAL ENURESIS.

BY GEORGE M. GOULD, A.M., M.D., OF PHILADELPHIA.

On November 12, 1891, a little girl, M. S., nine years of age, a "nervous child," with headache, no appetite for breakfast, etc., was brought to me for treatment. The mother stated that the child slept very poorly, having frequent night-terrors, was somnambulistic, and had "other troubles," the nature of which I did not exactly learn until subsequently. Under a mydriatic I found the following remarkable error of refraction:

R. + sph. 0.75 D. \bigcirc cyl. 5.00 D. ax. $100^{\circ} = \frac{20}{LXX}$.
L. + sph. 1.00 D. \bigcirc cyl. 5.00 D. ax. $85^{\circ} = \frac{20}{LXX}$.

After wearing the glasses I then prescribed the visual acuteness became in a short time normal in the right eye, but it was a year more before I succeeded by the "blinder-treatment" in bringing that of the left eye to normality. The headaches soon passed away after getting the glasses, likewise the nightmare, and the appetite became good. Within a year the child was as robust and hearty as could be desired. At this time I first learned that for years prior to consulting me the child had been afflicted with nightly enuresis, for which all treatment had been in vain. This had continued up to the day of instilling the mydriatic and applying glasses, but from that day it has never occurred once since.

The second case was not cured so suddenly, as the circumstances, age of the patient, continuance of the malady, etc., were not by any means so favorable. The boy was fourteen years old, had been afflicted with frontal headache "all his life," and had also had "fainting spells" for a number of years.

There had also been a frightful catarrh. Many physicians and surgeons had been consulted for nocturnal enuresis that had persisted from infancy, but all treatment and operations had been without effect. I found a high degree of compound hyperopic astigmatism and hyperphoria. After prescribing glasses the headache disappeared at once, and a partial ptosis of the left lid also disappeared. The wetting of the bed did not stop immediately, but did do so "very soon afterward." The patient disappeared from view, and it is only lately that I have learned that the enuresis stopped soon after getting glasses, and has not appeared since. The parents now ascribe the cure to the glasses, and I agree with them. As general treatment of the boy's health was also instituted by me, a legitimate suggestion might arise that the cure of the enuresis might have been due to that instead of to the stoppage of eye-strain. General treatment, however, had been previously thoroughly tried, but in vain until the ocular treatment was added. Taken in conjunction with other cases, I think that the reflex had its source in the eyes.

Another little girl, G. M., eight years of age, was brought to me December 14, 1889, with a history of headaches and of chorea during the preceding four years. The choreic affection was limited to the face and to the hands and feet. She was a very restless child, the hands and feet jerking and moving all the time, even in sleep, and "she talked in her sleep all night." Nocturnal enuresis had likewise existed for four years, and occurred every night. In this case there was difficulty in getting the child to wear glasses correcting the anisometropia. The chorea and other symptoms gradually ceased during the first month or two, but resumed again with their old intensity when she "lost her glasses" and was without them for two months. In June, six months after the first visit, I again took the case up, and prescribed other glasses, and they were now worn continuously. On October 2, 1892, with great patience, I succeeded in getting a still more accurate correction of the error of refraction (compound hyperopic astigmatism), a task of the utmost difficulty. But long prior to this date the enuresis,

chorea, night-terrors, etc., had entirely disappeared. The nervous system had been so profoundly deranged that a sudden cure was not to be expected, but that the eye-strain bore a causal relation to the symptoms of enuresis and chorea, I have no doubt.

On March 12, 1894, a little girl, M. S., six years of age, was brought with a history of great nervousness, kicking about and crying out in her sleep, headaches, painful eyes, etc., and with nightly enuresis. From the day glasses were given her these symptoms disappeared "as if by magic."

On October 13, 1894, Dr. O. P. Rex sent me a child of ten years, H. S., who had headache a great deal, and painful eyes. I did not at this time know that the child had been afflicted with persistent nocturnal enuresis for years, for which all treatment had been in vain. I found the following vicious error of refraction:

R. and L. + sph. 4.50 D. \bigcirc + cyl. 2.00 D. ax. 90° .

This gave her only $\frac{20}{60}$ visual acuteness, which, however, soon improved by wearing the glasses, until one eye had normal acuity in a few weeks, and the other by the blinder-treatment is steadily gaining. Headache, etc., at once disappeared, and from the day of applying the glasses the child never "wet the bed" again.

Besides these cases I have had others in which I am moderately certain that the eyes were the ultimate or a contributing cause of the affection under discussion, but in which the cure was either more slow or the etiology more suspicious, and I do not include them in this report.—*Medical News*.

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SQUINT.—WITH SPECIAL REFERENCE TO ITS SURGERY.

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The object of this paper is briefly to cite a few points by way of argument in favor of advancement of the weaker muscle instead of tenotomy of the stronger one in the correction of most cases of strabismus, where surgery is the means resorted to, and also to make more widely known to my colleagues certain methods of operating, and their results, hitherto published, some not at all, and others to a very limited extent. As to the first proposition, what I have to say is the result of observations, I believe I may safely say, of several thousands of cases in the dispensary, hospital, and private clientèles of a number of prominent oculists in various parts of the world, to say nothing of those occurring immediately in my own practice; in all extending over a period of more than eleven years.

As to the second proposition,—the surgical methods re-

ferred to,—they are such, for the most part, as I have employed in several hundreds of dispensary, hospital, and private cases (to be somewhere near exact, about 325), upon which I have operated during the past six and a half years.

The squint in question is neither that latent kind, so often spoken of in recent years under the names of insufficiency and heterophoria, nor that which is the result of paralysis; though it is the writer's solemn conviction that for these, when surgery is indicated at all, the same means are the best that are best for squint in general; but it is with the commoner forms of convergent and divergent, idiopathic, strabismus we have now to do. Given in the order of their frequency, as I have found them, these are:

1. Convergent. (Constant and Monolateral).
2. Divergent. (Constant and Monolateral).
3. Convergent—Alternating.
4. Convergent—Intermittent.
5. Divergent—Intermittent.
6. Divergent—Alternating.

Those rarer forms of strabismus, such as sursum-vergent (turning upward) and deorsum-vergent (turning downward), we may here pass over with the mere statement that they are usually associated with convergence or divergence, and that they are particularly subtle and complicated.

Of all the terms with which modern ophthalmology is burdened, that of "convergent concomitant," as applied to the commonest variety of strabismus, is the most useless and misleading. Even as explained in the best text-books the phrase is inappropriate, from the fact that there we are told the eyes, in this form of squint, are both capable of all normal movements, but that they retain throughout said movements their relative position, or deviation; whereas, in examining such eyes we find, almost invariably, limitation of motility in the direction of that muscle away from which the eye swings; in other words, poor abduction in convergent, and poor adduction in divergent strabismus. Literally construed, this term would mean that both eyes squint at the same time. As a matter of

fact, normal eyes are always concomitantly convergent. There is no such thing among them as either absolute parallelism or divergence, at least as regards the axes of vision. Whether we look at one of the fixed stars, or at an object close up, these axes will meet at the object. It is true, however, that as regards the muscle which is at fault there is true concomitance. That in convergent squint we usually find weakness of both externi, and in divergent, of both interni. Indeed, we find in many cases that the squinting eye is possessed of the better muscular system of the two; the straight eye, in such instances having, however, the better vision or the lesser error of refraction, something sufficient to cause it to fix in preference to its more muscular fellow. But in every case, almost without exception, one eye fixes while the other deviates; only one eye is crossed.

As to the primary or essential cause of these usual forms of squint I may state, in few words, that I believe it to be found, as a rule, in the muscular system of the eyes; the faulty muscle being the muscle allowing the eye to turn. This muscle is from some cause put at a disadvantage, it lacks tone, it is inserted too far from the cornea, etc. It is a mistake, therefore, in my opinion, for instance, to consider the interni too strong in the crossed eye, and the externi too strong in the "wall-eye."

A great deal has been said about hyperopia as a cause of convergent strabismus, and myopia the cause of divergent, and it is doubtless true that they are factors, but I absolutely deny that they are prime factors. True, the great majority of squint cases are of the convergent variety, and most of them in hyperopic eyes. There are also a good many cases of hyperopia associated with divergence, and of myopia where exists convergence. I have myself observed a number of them. But it is also true that most of the eyes in the world are hyperopic. We see one hundred pairs of hyperopic eyes of all grades where we see one that squints. It is like the old question and answer, "Why do white sheep eat more than black sheep?" "Because there are more of them." Besides, a hyperopic eye is, in

certain respects, an undeveloped eye, whose muscles may, from the same cause, be prone to certain weaknesses. No one can consistently ignore the inevitable relation between the acts of convergence and accommodation of the eyes, and the inclination to over-convergence caused by the excessive accommodative effort of hyperopic eyes. Neither can we be blind to the fact that all eyes, up to middle life, are possessed of what is known as "relative ranges" of convergence and accommodation quite ample to prevent squint, all things else being equal. But all eyes cannot remain straight when handicapped by both errors of refraction and muscular weaknesses. Correct the one, and sometimes the other also yields. Hence it is, that probably ten *per cent.* of the cases of convergent strabismus in children, with fairly good vision in both eyes, will disappear by the accurate fitting of convex glasses. It is my firm conviction that, given a pair of eyes with normal, well-balanced muscular systems, and their state of vision and refraction may be what it will, hyperopic, myopic, or astigmatic to any degree; blindness, partial or complete, in one or both, and there must be something wrong with the muscles which control their movements if they be not straight. As is well known, in squint the deviating eye is usually characterized by poor visual acuteness, often by scarcely any vision at all, this amblyopia being sometimes congenital, and sometimes acquired. Deprived thus of the power of good binocular single vision, and there being a defect somewhere in the co-ordination of the lateral muscles, the worse seeing eye is allowed to follow in its own bent, as it were, and it swings into its position of greatest repose.

And this brings us to the point that there is, moreover, in the very anatomical arrangement of the eyes and their recti muscles a very good reason why the convergent should be the kind of squint most frequently met with. In observing the accompanying diagram (Fig. 1), borrowed from Landolt, who first pointed out the fact, my meaning will be readily perceived. We are accustomed to think of the eyes when in the position of greatest rest, *i. e.*, when their optic axes are directed straight

ahead, as if their recti muscles were directed straight backwards (or forwards, as one is a mind to put it), in the same line. Instead of this, as one may see, there is a decided angle between the direction of the long axes of the muscles and that of the optic axes. Approximately, 33° . So that, relatively speaking, there is already convergence when the eyes are straight. Hence, it would seem less unnatural for an eye to swing in-

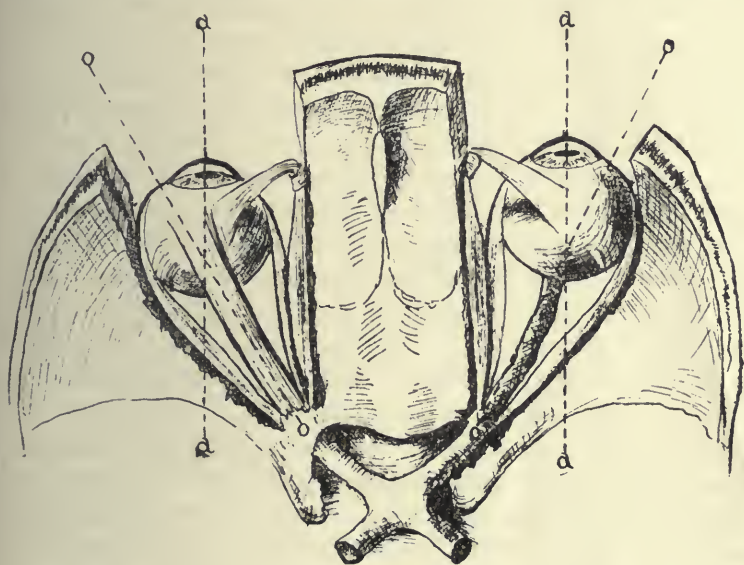


Fig. 1
aa Antero-posterior axes of globes — parallel
oo General direction of recti muscles.

wards than outwards. There being three recti muscles tending more or less to rotate it inwards, as against one whose action is in the opposite direction. Yet I read not long since in our leading American work on ophthalmology these words, "an eye so nearly blind that it wanders outward simply in obedience to the tendency impressed upon it by the outward direction of the axis of the orbit." ¹

¹ Noyes, "Diseases of the Eye," 1890, p. 173.

Herein, by the way, might lie the secret explaining some of the cases of divergence associated with high degrees of myopia. How easy for the long axis of this already elongated globe, enclosed by these diverging recti muscles, to fall in line with their long axes and be held there, looking outward.

In view of these facts, then, what would seem to be the rational, logical and proper operative treatment for the correction of squint? Should we cut off the tendon of that muscle towards which the eye deviates, a muscle already well adjusted, and none too strong, (and the tendon must be completely severed to get pronounced effect), allowing the muscle to slip back and become attached, nobody knows where, perhaps to nothing in particular, forever crippling motility in that direction, not improving it in the opposite direction, and disturbing the general muscular equilibrium of the eye? Or should we give our attention to the muscle actually at fault, that away from which the eye swings, and endeavor to give it greater power over the eyeball? This question, I, for one, have long since answered in thought, word, and deed. Experience and observation lead to the conclusion that a completely tenotomized muscle, if left alone, remains permanently disabled. Examinations of eyes whereon tenotomies have been made for strabismus almost invariably show one or two of three conditions, viz.,—continued squint of the original kind, squint of another kind, and limitation, or lack of motility in the direction of the operated muscle. They reveal, too, other deformities, such as retraction of the caruncle, and more or less protrusion of the globe. The worst of it is that these evil consequences are, in most cases, not speedily apparent; it may be months, and months, before they are fully realized, making prediction as to final position, and attachments of the tendon highly problematical, and the ultimate effects after tenotomizing most uncertain. Many of my advancements have been made on these very muscles that had been formerly cut away and snapped back like India-rubber, and the patient has come to have his second dose, and opposite kind, of squint, removed.

True enough, complete tenotomies can be made in certain

eyes, where the tendon is well wrapped in strong folds of capsule, provided these supports are left undisturbed, but eyes are extremely variable in this respect and it is very risky business. It is also true that there are, again, rare cases as, for instance, exaggerated turning of an eye, occurring mostly in older adults and elderly persons, the deformity having been of life-long duration, where there is really a shorting of the muscle towards which the globe is turned, and where a setting back of the tendon is not only advisable, but, at times, imperative. Among my operated cases occurs that of a lady past sixty, having convergence of 60° in the left eye, who sought relief from boring pain in the orbit of that side, and whose left internus was so short and unyielding that it was not possible, even with the aid of fixation forceps, and considerable force, to rotate the eye far enough outwards to bring the pupil to the median line. Under such circumstances I have long been accustomed to make a curbed tenotomy; described later. But in very few of these exceptional cases is the tenotomy alone sufficient; for, to obtain good, lasting results, it must be combined with advancement of the opposing muscle.

As to partial tenotomies and button-holing, so long as they *are* partial, the result is apt to be only a temporary weakening of the muscle without permanently affecting the position of the eyeball, unless, perchance, the cutting be all at one side, in which event, there may be an abiding tendency of the eye to swing away from the cut border, up or down, as the case may be.

On the other hand, properly advancing a muscle serves to increase its power over the globe, for obvious reasons. As Dr. Landolt long since observed, it gives the tendon a greater amount of rolling and unrolling on the eyeball. Apropos, I quite agree with this most finished oculist in what he recently said on strabotomy before the International Ophthalmological Congress at Edinburgh. Tests of motility of the eye in the direction of the muscle before and after advancement always show more extended movement due to the operation. The effect of a neat advancement is positive and lasting, while that

of a like tenotomy, no matter how carefully made, is prone to uncertainty. Another evidence of improvement of the muscles by advancement I have observed. Among my cases a number of them, after the operation, immediately chose to fix with the operated eye, although before the advancement this had been the eye that habitually squinted, and the remaining squint, *i. e.*, whatever amount was left uncorrected by the first operation, was transferred to the other eye. If this phenomena ever occurs after tenotomy I have never seen nor heard of it.

In this connection I may state, that while it is not generally necessary, for cosmetic purposes, to advance both the faulty muscles, it is, nevertheless, in order to obtain the best results, highly desirable to do so. However, I have great respect for the popular dread of aught in the nature of a surgical operation, so that where the squint is not too extreme, and the limitation of motility in the direction of the weaker muscle in the fixing eye is not too pronounced, I am willing to attempt correction of the deformity by advancement on the deviating eye alone.

If there chance to be among my readers those who fancy that it is a waste of the valuable space of this journal thus to urge a theme on which so much has been already said, I would have them cast their eyes about them somewhat, visit the eye-clinics, read the reports of eye-hospitals, familiarize themselves with the private work of other oculists, and I promise you, they will be surprised, yes, often astounded, at the great number of tenotomies and the great paucity of advancements, made for strabismus, in some instances actually made by men who admit the superiority of advancement to tenotomy. The last is so easily and quickly done, and with so little inconvenience to one's patient. One of the largest eye-institutions in the United States in its last report, gave two advancements and a hundred or so tenotomies.

As I said before, I try not to be a crank on the subject of operating. I exhaust all other means first. At the very beginning make a thorough and exhaustive examination of both eyes as to degree of squint, acuity of vision, state of refraction,

ophthalmoscopic appearances, motility and power of fixation in various directions, etc. Correct errors of refraction, advise as to general health, prescribe exercise of the squinting eye while the other is covered; gymnastics of weaker muscles, etc., whenever these things seem indicated. If glasses are fitted they are worn long enough before operating to give a reasonable time for spontaneous righting of the eyes.

The advancement operation I make—the fist single suture one of which I have any knowledge—is one I devised some six and a half years ago, a brief description of which was published in the AMERICAN JOURNAL OF OPHTHALMOLOGY—issue of 1889—but as there has been so much of refinement added to the various steps of the procedure in the interim, I desire to describe it anew. And I have been all along impressed with the idea that this is an operation pre-eminently dependent, for happy results, upon the very closest attention to minute detail, and wherein deliberation is a good second to precision. Such surgery cannot be successfully done after the style of the fourth pass of a fencing bout. I once knew a man who was wont to make tenotomies of recti muscles against time, and who plumed himself greatly upon his ability to cut a tendon smack, smooth off in forty seconds, by the watch. Now, however commendable, or otherwise, such practice may be, the operation here considered will not conform to any such *grand coup-de-main*.

The usual antiseptic precautions having been taken, the eye made numb by two or three drops of a four per cent. solution of cocaine—general anæsthesia being not only unnecessary, but highly undesirable, excepting in cases of very young children or extremely nervous people,—and held widely open by the blepharostat, the first step is usually the button-holing of the tendon of the muscle opposite to that which it is proposed to advance. This partial tenotomy is not calculated to produce any permanent effect upon the position of the eye, nor the strength of the muscle, but is for the purpose of breaking, for the time, the power of that muscle, so that it will not, by its dragging and tugging, prove a factor for the undoing of the

work of advancement. In making the button-hole one should expose the bare tendon, but avoid all needless traumatism, and be very careful to leave intact a few fibres of each border. It is in this connection that we have great cause to thank Dr. Stevens, of New York, for the small, delicate instruments he has given us for strabotomy. A number of times, however, I have left untouched the opposing muscle, especially when the deviation was slight, though, in one instance, there was convergent strabismus of 45° . Passing now to the advancement proper, the patient is told to look far to the opposite side; with mouse-tooth forceps the conjunctiva, and only this membrane, is picked up in a vertical fold, well back of the insertion of the muscle; with small, straight scissors, slightly blunted at the points, a snip is made across the fold, precisely over the center of the tendon, and the incision, thus begun, is carried forwards horizontally till it reaches the margin of the cornea. After the conjunctiva, the anterior prolongation of Tenon's capsule is picked up and divided in the same way, then the episcleral tissue, if there be enough of it, is, in like manner, incised, so that a furrow is opened whose button is the naked sclera, and along which the cut tendon is to slide. By so doing one reaches the tendon by positive stages, neatly and discriminately, and avoids giving it an unguarded snip, which is possible with too heroic cutting. The tendon being now well in view, is slightly lifted by the forceps and a Stevens' hook inserted beneath it, as close as can be to the insertion; and not a great, lumbering hook shoved far back through the opening, point down, then made to turn a summersault somewhere in the orbit, giving the globe a vicious rake, and landing, point up, beneath the muscle. All such gouging and prodding behind the insertion tends to increase the extent of subsequent adhesion, hence, to lessen the efficiency of the muscle's action. No advancement forceps are put on, to chew up the tendon, an assistant holding the hook until the suture is placed. This last is a No. 1, braided, black silk, and is double-armed, *i. e.*, has a needle at each end. The needles are as fine as will barely carry the thread, and are straight two-thirds of the way from eye to point, from thence

slightly curved. Both needles are passed downwards through the tendon (see Fig. 2), at a distance from its insertion proportionate to the degree of effect desired, one near the upper, the other near the lower border, and the loop, or stitch, thus

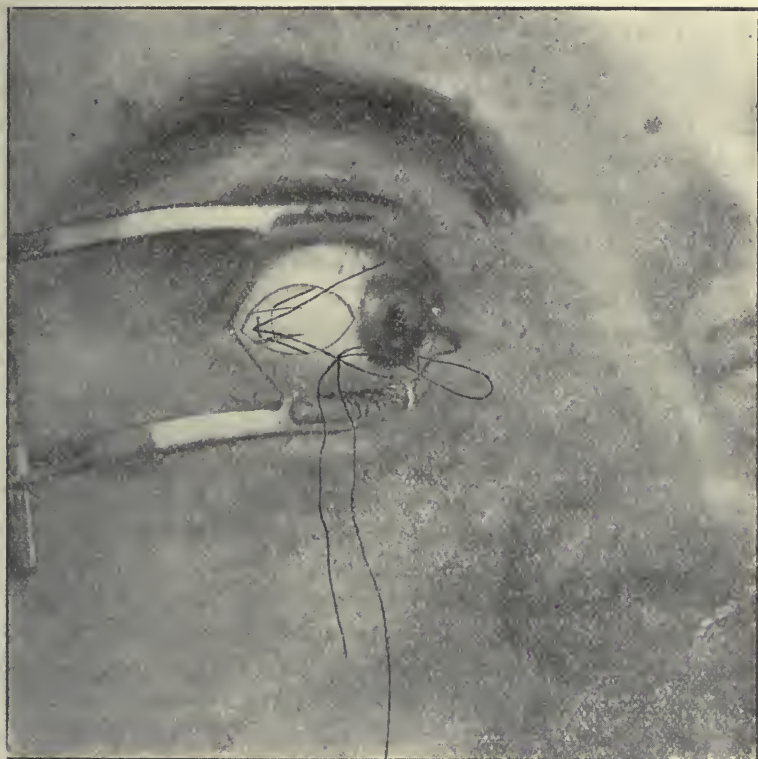


FIG. 2.

formed, is drawn down snugly upon the tendon (or, for the present, it may be left standing up somewhat—not drawn entirely down). Then, taking the upper needle in the holder, the conjunctiva and anterior capsule are lifted by the forceps, and the needle passed beneath these membranes, pretty well

forwards, then plunged into the episcleral and sub-capsular connective tissues, and plowed along until a point is reached opposite the vertical meridian of the cornea, and fully two to three millimetres from the limbus, where the needle is brought out. Precisely the same is done with the other needle below. Now, obviously, if the ends of thread were here tied the suture would lie across the cornea; instead, however, the upper needle is again placed in the holder and passed from behind under the loop, or stitch, that lies vertically on the tendon (see Fig. 2), and one must be quite sure that the needle really passes *under* the thread, and not *through* even the least strand or fibre of it, for this would cause a snarl in drawing up the suture, and do away with one great feature of this operation,—that of a perfect sliding pulley. To make sure, we would better include a little of the tendon here, or else leave the loop standing up a little so that we may see clearly what we are doing. It is better to make an invariable rule of using the upper thread for this step as, in the first place, the knot does not lie beneath the sensitive upper lid, and, in the second, the removal of the suture is made simpler and easier. The parts have now been threaded, so to speak, and we proceed to divide the tendon. The thread is got out of the way of the scissors,—if need be, held out of the way by an assistant, with a strabismus hook,—the hook beneath the tendon is taken by the operator, and, with very delicate scissors,—Stevens' are excellent for the purpose,—(slightly blunted, and curved on the flat) the tendon is completely severed. (See dotted line, Fig. 2). Next, the stump of tendon, at its insertion, is seized with the forceps, and cut off even with the sclera. The latter step serves two very important purposes, it removes an obstacle to the sliding forward of the tendon, and prevents an unsightly lump at the site of the operation. Then, as to the tying, and tightening of the suture, several points must be closely observed. One may have his assistant rotate the eye towards the muscle or not, but the patient should not be told to attempt such rotation. It is essential that the loop across the tendon should remain tightly drawn down, and to insure this, and at the same time obviate

any tearing up of the track of the suture where it is imbedded under the conjunctiva, take hold of the upper thread with the dressing forceps, and lower one with the fingers just where it emerges above and below the cornea, and pull, not back, in the direction of the advancing muscle, but away from it—in Fig. 2 towards the nose. Having, in this way, drawn the muscle well forwards, the assistant “takes up the slack” of the end of the thread which passes beneath the loop, gives it to the operator, who lets go with his dressing-forceps, and ties the suture. After passing the ends through twice, in the usual way, the final tightening up is done,—and it probably is better here to have the helper rotate the eye towards the advancing muscle, but taking care to do so as nearly as possible in the horizontal plane. In this procedure one notes certain most commending features of this operation,—the tension being equal on all the thread-bearings, the advancing tendon is drawn neither up nor down, but comes forward in a straight, horizontal line, a line coinciding with that of the longitudinal axis of the muscle, and, consequently, with its action. This effect is next to impossible with a multiple suture operation. Moreover, the pull being from points so far forwards as the vertical diameter of the cornea, the maximum of advancement can be obtained,—that is, the cut end of the tendon can be drawn up to the margin of the cornea. Certainly no such degree of advancement can be accomplished by any suture, or combination of sutures, where anchorage is given the same in tissue lying between the cornea and the operated muscle. To get very decided permanent effect after advancements, one must, as a rule, strive for even more decided primary effect—even *over-effect*. As to the degree of primary effect I believe one must be guided solely by his judgment, for to attempt actual measurements and calculations as practiced by Schweigger, for example, seems to me, in view of the yielding nature of the tissues holding the thread, to be rather an absurd procedure; and, as I believe it best to *advance* the corresponding muscle of both eyes, in the great majority of cases, and not to materially *shorten*, the muscle by resection of all or the greater part of its tendon

—the cut end of the tendon must be got past the point of original insertion. I have demonstrated, in quite a number of my cases, that there was actual adherence of said end of tendon forward of said insertain. Following the example of Dr. Prince, I leave the suture tied in a long bow-knot, the shorter end of thread being always the one which controls the loop,—so that, after the lapse of twelve to sixteen hours, if, for any reason, there be occasion for modifying the effect upon the eye, the last part of the knot may be untied, and the suture either tightened or slackened, as desired. On first removing the bandage, whether one wishes to shift the suture or not, the long ends and loop of thread, which have been till now fixed by the dressing just outside the nearest canthus, are, before re-bandaging, cut off close to the knot. The suture is allowed to remain in the eye from five to eight days, the dressing being renewed during the time at intervals of about forty-eight hours. Only the one eye is ever bandaged. Not among the least of the advantages of this operation is the facility with which the suture may be removed. Strange to say, I have observed more nervous dread, and flinching on the part of patients relative to the taking out of the thread than to the making of the operation itself. One has merely to grasp the knot with delicate dressing-forceps, cut the thread to one side of the knot, it does not matter which, and it comes readily away. If the knot itself is not seized one risks attempting to pull the same through the tissues. The suture that holds the tendon also serves to close the conjunctival incision. So effectual, indeed is this closure, that I have never seen a granulation button here, while at the site of the partial tenotomy which accompanies the advancement, although the incision there is much smaller, the omission of a closing suture often results in a granulation tumor at that point. To end, in a few words, what I have to say concerning this operation, permit me to state that, in every case, the outcome has been most gratifying. Of these several hundreds of cases I have not seen a single eye that even threatened serious reaction. While, as before stated, I usually expect to make the second advancement before correcting the squint,

in only one instance was it necessary to make the third,—this in case of a young woman with excessive convergent strabismus (65°) associated with myopia of nine dioptries, all apparently of life-long duration. The externus of the deviating eye was so thin and weak that the ordinary advancement was not sufficient, so that, in making the second upon it, not only the tendon, but its aponeurosis also, was brought forwards, and with entire correction of the deformity.

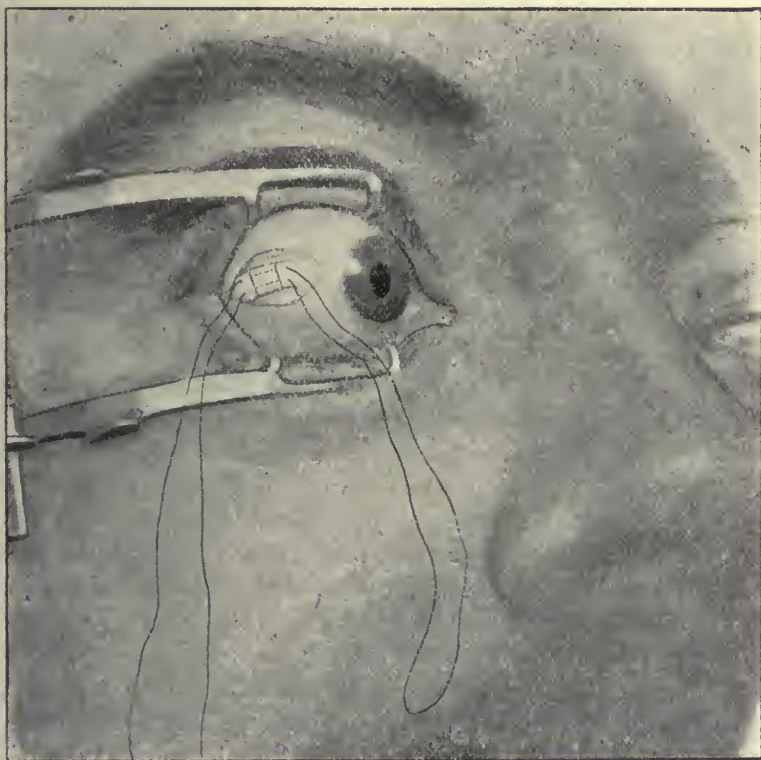


FIG. 3.

Figure 3 illustrates an operation I have hit upon within the past year, which is adapted to certain cases where shorten-

ing of the muscle, and not advancement is desired. (For it must be borne in mind that muscle shortening and advancement are not identical. The folding or looping, up of the tendon, so popular among certain eye-surgeons, both in this country and Europe, is a shortening and not advancement). Here also the suture is a double-armed one, the needles being of the half-curved variety, and very fine. The primary incision is the same as in the advancement, but less extensive. Here the advancement forceps must be used. This instrument fixes the tendon midway of the parallelogram included between the black lines (Fig. 3). The tendon is then divided at the point occupied by the black line nearest the cornea, and the forceps given to an assistant. Catching hold of the stump of tendon with mouse-tooth forceps the needles are passed down through the insertion, hugging the sclera, one near the upper, the other near the lower border. They are then carried beneath the tendon, without crossing the thread, and brought out, correspondingly, from below, and far enough back of the fixing forceps to insure a firm hold; the loop, however, is not drawn down, but is left very long, as shown in the drawing. Here the operator takes the forceps from the assistant and cuts the tendon at the point indicated by the other black line, thus resecting a portion. The long loop, and the two ends of thread are then tied in one knot, and the cut ends of tendon nicely butted together. The improvement claimed for this over certain other shortening operations lies in the fact that the thread embraces and supports the united ends of tendon both in front and behind, so that they are kept in nice apposition, and not inclined to stand up in a pout.

The curbed tenotomy, referred to further back, is similar to the advancement, though, of course, the object in this instance being to drop the tendon back a definite distance and there fix it, the thread is not carried forwards at all, but is brought out above and below in vertical line with or very slightly in advance of, the point where it is put through the tendon, and, obviously, as there is no cornea to avoid, the manoeuvre of passing the upper end under the loop lying on the tendon,

is omitted. The tendon is cut at the insertion, and the muscle dropped back to the requisite extent and the suture tied.

There is much more that I would like to say concerning squint; in truth, I may say, as to the muscular anomalies of the eye in general, but then the paper would be far too bulky for publication in a journal—it should be in the form of a monograph. It should contain a systematic report of all my squint cases,—their histories, examinations, treatment, condition when discharged, and ultimately the whole arranged in condensed tables. It should go more thoroughly into the theory of strabismus, and should embody a description of certain original methods of experiment with the cadaver, on the ocular muscles *in situ*, and the deductions therefrom. I refer to the fixing of cords to these muscles at their points of origin,—the latter having been cut through,—and making study of the movements of the globe. If I mistake not, some one has recently told of doing something very much like this, a species of investigation which I instituted as long ago as 1890.

SOCIETY PROCEEDINGS.

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

Stated meeting, Thursday, December 13 1894; D. ARGYLL
ROBERTSON, M.D., F.R.C.E., President, in the chair.

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FIVE CASES OF PLASTIC CELLULITIS OF THE ORBIT.

MR. GEORGE LAWSON read this paper. In four of the cases there was no pus, and in one a little pus was formed towards the end of the illness, and escaped through one of the exploratory incisions which had been made into the orbit. Of the five cases three died, one required excision of the globe, and one recovered with impaired sight. The symptoms were pain in the orbit, œdema of the eyelids, and proptosis coming on shortly after the first symptoms, with increasing loss of sight; high temperature, from 101° to 107° . The symptoms rapidly increased in severity, the eyelids became purplish red, and œdematous, and the upper lid tightly stretched over the protruding globe. There was pain in the orbit, varying in intensity. If the symptoms were not relieved by treatment, the patient became delirious, then comatose, and died. In none of the cases had the patient received any injury, nor in any was there a trace of syphilis. In four of the cases the cellulitis was confined to one orbit, and in one there was cellulitis of both orbits. Four were women, and one a young man. Mr. Lawson's impression was that those cases were due to septicæmia, but in three he was unable to trace whence the septic

matter came. In Case III, the cellulitis of the orbit was preceded by acute tonsillitis, and to this was probably due the orbital cellulitis. In Case V, the patient was certainly suffering from pyæmia before the cellulitis of both orbits came on. She had a pyæmic rash on the face, high temperature, 103.4° , and pain in all her large joints; but the source from which the pyæmia originated could not be determined. Mr. Lawson said that in women he felt certain septicæmia occurred more often than was suspected from septic materials supplied from the vagino-uterine track; and he thought that some of the so-called rheumatisms, to which women were so much more prone than men, were really septicæmia, probably induced from this source.

MR. TWEEDY considered all such cases very grave. He had had a recovery in one case, seen by Mr. Lawson, which he attributed to a free division of the upper eyelid extending to the orbital margin; by this means the tension was greatly relieved, and the patient recovered. The swelling disappeared, and the movements of the eye, though at first very limited, eventually became free, and the sight almost normal. Since then he had had one other case in which he had made a similar free division of the upper lid; in this case there was complete recovery. In one of his cases there had been an operation on the lachrymal duct some time before, and in the other the nasal mucous membrane had been cauterized, and he attributed some importance to the fact of there having been a previous injury.

MR. HULKE thought it a pity that there was no necropsy in these cases; it was a question whether the orbital cellulitis was primary or secondary to a thrombosis of the ophthalmic vein or cavernous sinus, or to a meningitis. He mentioned the case of a lady who had pyæmia after removal of her breast; there was thrombosis in the cavernous sinus and veins of the choroid. Some of the mild cases were the result of influenza or measles, and these mostly recovered.

MR. CRITCHETT had shown one case before the Society some years before; it was supposed to be due to retained mo-

lar teeth, and recovered after removal of the molars. He agreed with Mr. Tweedy that free division of the lid should be made.

DR. BRONNER had seen cellulitis of this kind after injury to the nose.

* *
* *

HYDATID CYST OF THE ORBIT.

MR. LAWFORD read notes of this case. The patient, a girl, aged 17, came to the hospital in September complaining of pain in and around her right eye. There was moderate proptosis, with some displacement of the eyeball downwards and outwards; limitation of movements upwards, inwards, and to a less extent outwards; some œdema of lids and conjunctival congestion; V.=⁶/_{XVIII}; optic papilla much swollen; retinal veins dilated and tortuous; a few small retinal hæmorrhages. The symptoms had been noticed for two months. All the above-mentioned conditions increased during the next ten days, and the patient was taken into the hospital for operative treatment. A deeply-seated tense tumor could then be felt behind the trochlea of the superior oblique, but there was no fluctuation. The tumor was cut down upon, and an exploratory puncture made with a syringe; perfectly clear fluid was withdrawn, and the tumor then collapsed; a larger incision was made and the cyst walls were seized with forceps, and a cyst about the size of a walnut easily withdrawn. The character of the fluid was those of a hydatid, but no hooklets, scolices, or daughter cysts could be found. The wound healed rapidly, and the displacement of the globe slowly gave way; its movements in every direction except inwards soon became normal, but probably from damage to the internal rectus during the operation the eye remained divergent. The swelling of the optic papilla quickly subsided, and vision was fully restored. Two months later there was no sign of recurrence of orbital growth. Mr. Lawford referred to the rarity of hydatids in the orbit and advocated early interference in these cases, before sight has be-

come irreparably damaged. The best plan, he thought, was to expose the tumor by dissection, then incise it, or draw off the fluid contents by a syringe or aspirator, and subsequently endeavor to remove the collapsed cyst through an incision enlarged sufficiently for this purpose.

THE PRESIDENT has had a case of this kind seventeen years ago, which he treated by puncture and removal. He thought the defect of movement in Dr. Lawford's case was due to an interference with the nerve supply rather than to accidental division of the internal rectus.

MR. ROCKLIFFE had had one case in which he had to excise the eye owing to the patient deferring the operation; the cyst was found to be suppurating.

MR. JOHNSON TAYLOR had had a case in which there was a cyst at the upper part of the orbit; it was a question whether it was a meningocele or not. It was tapped, and the fluid not being meningeal, the cyst was removed.

MR. LAWFORD, in reply, said there was some difficulty in distinguishing between a hydatid cyst and a meningocele, but it was always safe to tap the cyst and examine the fluid.

* *

OSTEOMA OF THE CONJUNCTIVA.

MR. HARTRIDGE read this paper. R. W., aged 3 months, was found to have a swelling at the outer part of the right eyeball, which was noticed three days after birth. It was diagnosed as a dermoid growth and was removed. It measured 12 by 6 millimetres, and consisted of a superficial soft part and a deep hard one, the latter being like an incisor tooth in form. On examination it was found to be bone covered by periosteum; in one part like an ivory exostosis, in another cancellous. It had not the proper structure of a tooth.

THE PRESIDENT had had a case many years ago exactly similar in position and appearance to the one now recorded.

* *

FORMOL AS A HARDENING AGENT.

MR. MARSHALL read this paper. Formol was introduced by Professor Leber; it was supplied under two names—formol or formaline. A ten per cent. aqueous solution of this was best suited for hardening purposes. If an eye was placed in this fluid for twenty-four hours it became perfectly hard, and could be cut easily; the eye retained its natural fresh appearance, the cornea and lens were transparent, the iris normal; blood and pus appeared unchanged, the vitreous was unaltered, and the retina and choroid remained *in situ*. There was no need to freeze the eye in order to cut it, as was necessary after hardening in Müller's fluid.

THE PRESIDENT thought as a hardening agent it was almost perfect.

MR. JULER had used it, and found it very satisfactory. In one case an eye had been put into a full strength solution by mistake, but it had not been harmed by it.

MR. LINDSAY JOHNSON had used it before Leber introduced it, but had given it up, as he thought some other agents were superior. Formol precipitated metallic silver from solutions of its salt; and, in this way, by precipitating silver in the tissues, it might be very useful.

* *

PAPILLARY CONJUNCTIVITIS.

DR. ADOLF BRONNER (Bradford) read notes of a case of papillary conjunctivitis of the left eye due to the prolonged internal use of arsenic. The patient a youth of 22, suffered from chronic eczema of the skin. In July he began to take arsenic, in pillules of one milligramme. For two months he had been taking twenty-four pillules daily; the eyes then became red and very irritable. There was a peculiar slight œdematous condition of the conjunctivæ and of the lids. Boric acid lotion and cocaine drops relieved the symptoms temporarily. In two weeks the patient returned. There were pinkish, small, hard,

irregular papillary growths of conjunctiva and of the left upper lid, most marked at upper end of tarsus. In spite of the local application of sulphate of copper, the growths did not seem to diminish for fourteen days. The arsenic was then discontinued, and, under treatment, the growths subsided greatly. The use of arsenic frequently gave rise to conjunctivitis, but there were no cases on record in which papillary growths had formed.

THE PRESIDENT thought it very problematical that the arsenic was the cause of the papillary growths; if it had been so they would probably have come in both eyes.

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CARD SPECIMENS.

MR. LANG—A Case of Cataract with Crystals in the Lens, with Microscopic Specimens.

MR. H. WORK DODD—(1) A New Pince-nez; (2) A Case of Congenital Lens Opacity.

DR. BRONNER—(1) Wire Shield for Use after Cataract Operations; (2) Benno's Writing Paper with Raised Lines for the Use of the Blind.

MR. G. LINDSAY JOHNSON—(1) Removal of Lens in a Case of Myopia; (2) Symmetrical Markings in a Case of Lamellar Cataract.

MR. N. C. RIDLEY—A Case of Congenital Coloboma in the Macular Region.

MR. W. J. CANT—Large Sarcomatous Tumor on the Right Side of the Brain.

MR. DONALD GUNN—Case of Tuberculous Iritis.

SELECTIONS.

A CASE OF EXOPHTHALMOS IN AN INFANT OF THREE MONTHS.

BY HARRIET E. GARRISON, M.D., DIXON, ILL.

The patient whose case forms the basis of this article, is the elder of twin boys, born June 30, 1893. This was the mother's third confinement. The labor was normal. The delivery of No. 1 was retarded by vertex presentation. He preceded his brother by forty minutes, weighed eight pounds, and No. 2 weighed nine pounds. No. 1 cried lustily and to all appearances was as strong and vigorous as No. 2. He was warmly wrapped in flannel and placed on his right side. After the third stage of labor was completed, and the mother was made comfortable, as I had but the assistance of an untrained nurse I looked after the children. I found the nurse bathing No. 2, and No. 1 lying as he had been placed at birth, but he had become blue and the extremities cold. In an hour's time by the application of dry heat and hot water internally he had lost the blue color and the hands and feet had become warm. When I saw him twelve hours afterward I could not distinguish him from No. 2, but the attendant said he required more care to keep him warm and comfortable than No. 2, which condition continued. It was two months, August 29, before I again saw the children. Then No. 2 was very sick with cholera infantum. At this time No. 1 weighed nine pounds and No. 2 eleven. On the next day No. 1 showed choleraic symptoms. No. 2 had much the more severe attack of cholera infantum but No. 1 was harder to treat. In a few days No. 2 was rosy

and vigorous while No. 1 continued to have gastro-intestinal troubles. September 27 the mother brought the babies to my office. No 1 was very much emaciated not weighing as much as at birth, but the most marked symptom was the protrusion of the eyeballs—they were apparently being pressed from their sockets. The mother said she had not noticed this condition until a few days previous. At this time I first noticed tachycardia, the pulse ranging at 240 per minute. The next week he was again brought to my office. The protrusion of the eyeballs was not as marked as the week before, but there seemed to be no change in the tachycardia. At this time, the mother thinking No. 1 would not live had them photographed. They are arranged to hide the protrusion of the eyes of No. 1 but it can still be seen. From this time on he continued to improve and in two months the mother told me he weighed fourteen pounds against sixteen for his brother. December 30 the mother again brought him to my office as he had been sleepless, cried a great deal, and his head was hot. He had two lower incisor teeth and the upper gums were very red and much swollen. At this time the mother called my attention to the tumultuous heart action. She said she had noticed it for several weeks, sometimes more violent than others. While in the office the beating was sufficiently violent to shake the clothing over the chest. The pulse rate was now 180 per minute. A careful examination of the heart showed nothing abnormal except the thrilling motion. In January he had a severe attack of la grippe with brain symptoms which continued 9 days; pulse 200, temperature 103° F. In the ninth month the pulse was 150, of good volume. The only difference discernible in the twins at this time was the pallor of No. 1 and the staring of the eyes. At the present time in the eleventh month, No. 1 is rosy and hearty looking, has lost the pallor and staring of the eyes, pulse 100, of good quality, creeps actively but does not climb, and stands as much as No. 2. No. 1 weighs nineteen and one-half pounds; No. 2, twenty-one and one-half pounds. No. 1 has all his incisor teeth; No. 2 has six. At this time the children were again photographed. In the photo-

graph the laxness of the muscles of No. 1 is very noticeable as he does not sit nearly as erect as No. 2. His mother tells me his head perspires when he sleeps.

Exophthalmos, Graves' disease, exophthalmic goitre, Basedow's disease, struma exophthalmia, tachycardia strumosa, cardio-thyroid exophthalmus are some of the names which have been applied to this disease—which usually has three prominent symptoms; tachycardia, exophthalmos and goitre.

Graves was the first to distinctly group these symptoms, but gave most prominence to tachycardia and exophthalmos. Then later, Basedow more fully described the symptoms, but made the goitre more prominent. Tachycardia is the first symptom usually observed; the other two varying in different individuals, sometimes the exophthalmos appearing first and sometimes the swelling of the thyroid gland. In this case the exophthalmos was the first symptom noticed. A mild tachycardia very likely existed before the child was brought to me, but the tumultuous heart action was not observed until nearly two months later when the exophthalmos had nearly disappeared, and at no time was any swelling of the thyroid gland observed. This agrees with a case recorded by Graves in which tachycardia was first noticed, then exophthalmos and two months later the thyroid swelling. Improvement began in my case so soon that the thyroid gland did not become involved.

I have now under my care a girl of 14, with goitre. The pulse is 120 with chlorotic bruit. The murmur is very marked over the carotids and thyroid. The patient's eye's are prominent but not protruding. In another young lady with well-marked goitre of right lobe the pulse was never over 120. Exophthalmos came on suddenly while she was being treated for goitre by electricity; the exophthalmos was relieved by treatment but the eyes still looked large. The goitre was but slightly reduced by treatment and is still noticeable at the present time, although she now seems perfectly well and is the mother of several healthy children.

CAUSE.—There was never any case of goitre among the children's ancestors, therefore heredity could be excluded.

The parents are both large, vigorous and healthy, of German descent. The grandparents are living excepting the paternal grandfather who died of acute pneumonia. The house in which the children live is one of the oldest in this section of country. It is located on low land near a small stream which at this point is quite sluggish. The difference between the air on the highlands and the lowlands was very noticeable as I drove down from the surrounding hills in the early morning hours on the day of the children's birth. Although it was very warm June weather the air in the house felt damp and cold, and I directed a fire to be lighted by which the children might be dressed. It is to this unsalubrious situation that I attribute the child's condition; weaker at birth than his brother he could not overcome the unfavorable climatic conditions. Why it should take the form of exophthalmos can perhaps be accounted for by the condition in which the child was an hour after birth. The venous stasis and coldness of the extremities showed a weakness somewhere in the child's system. It could not have been organic heart trouble or it would not have been so quickly relieved by the application of heat. There must have been a weakness of the nerve centres, which control the generation of heat and the vaso-motor nerves. This accounts for the failure of the child to rally from the attack of cholera infantum as this had farther injured the already weak nerve centres. Whether this condition was caused by the pressure on the brain from the vertex presentation or whether it was caused by a defect in nutrition during fetal life, I am not prepared to say.

TREATMENT.—The child had been taking almost continually, from the time it had the attack of cholera infantum, medicine to assist digestion and to tone up the system. As soon as I saw the child had exophthalmos I gave, in addition to the medicine it was already taking, arseniate and strychnia. A granule containing $\frac{1}{134}$ of a grain was dissolved in nine teaspoonfuls of water, and one teaspoonful of this solution was given every six hours. This was given regularly for a long time and was resumed as soon as the brain symptoms of la grippe were

controlled. The arseniate is giving as favorable results in the case of chlorosis now under my care. She has been taking it for a month, the pulse rate has decreased to 90 and the goitre is materially reduced. She takes $\frac{1}{67}$ of a grain every four hours.

DIET.—The mother having very little breast milk I gave in addition sterilized milk, and as is usually the case, when babies are given the bottle, the children soon became weaned from the breast and the sterilized milk formed the whole diet. After the attack of cholera infantum they were given condensed milk. This agreed perfectly with No. 2, and he has never been under treatment since, but did not agree with No. 1 and he was given, in addition to condensed milk, beef extracts and several infant foods. At the time of the exophthalmos, he was put on peptonized milk for a few days but was soon returned to condensed milk. After the attack of la grippe he was given sterilized milk which at the present time with bread and butter forms the diet, No. 1 consumes double the quantity of milk which No. 2 requires, but does not increase in weight any more rapidly than No. 2.

All the cases of exophthalmos or goitre which have come under my observation before this case, have been in females at puberty or later, for which reason I have always regarded tachycardia, exophthalmos or goitre as being a symptom or symptoms of reflex nervous origin—the uterus and its appendages being the source of irritation. But since studying this case, I have reached the conclusion that the disease is located in a sympathetic ganglion or ganglia, and the disease of the other organs is due to loss of proper nerve stimulus. And the proper treatment of these conditions is to increase the nutrition of the nerve centre.—*Journal of the American Medical Association.*

REPORT OF THREE CASES OF MONOCULAR HÆMORRHAGES OF THE RETINA.

BY HOWARD F. HANSELL, M.D.,

Adjunct-Professor of Diseases of the Eye, in the Philadelphia Polyclinic; Chief
Clinical Assistant in the Ophthalmological Department, Jefferson
Medical College Hospital; Consulting Ophthalmologist
to the Chester County Hospital.

CASE I.—Mrs. Z., widow, aged 48, noticed, in the early summer of 1893, the vision of the left eye became suddenly impaired to such an extent that she could perceive only the outline of the largest objects. Alarmed and distressed, she consulted the nearest available practitioner, who made light of the symptoms, and advised tonics and rest of the eyes. Finding V. did not improve, she shortened her vacation, and consulted me in August. At that time V. was reduced to counting fingers at five feet, media clear, no external evidence of disease, the optic disk moderately swollen and its edges indistinct, the retina infiltrated in the neighborhood of the fovea and nerve with numerous small hæmorrhages, the arteries of normal size, the veins tortuous, and both interrupted many times in their length by the extravasations. The retina was œdematous and hazy. The right eye was free from all disease. $V.=\frac{6}{vi}$.

There was no evidence of constitutional disease, nor did the patient make any complaint of her general health. Indeed, she had been unusually free from annoyances both mental and physical, during the past year, and had gained in weight. She was, however, in the midst of the menopause, and in the absence of any other cause, it is proper to conclude that this condition had some influence. During eighteen months of oc-

casional observation by the ophthalmoscope, I have not detected any material change in the retina, although for a day or two at a time Mrs. Z. says the sight is better, and then it falls back again. The treatment, carried out by Dr. George R. Morehouse, has been a restriction of the diet to easily digestible food, tonics, and small doses of potassium iodide.

CASE II.—Mr. D., aged 65 years, an apparently healthy man, leading largely an out-door life, a moderate eater, and abstemious in the use of alcohol and tobacco, short and stout in build, and of florid complexion, consulted me September, 1893, complaining of dull pain over the left eye in reading. He had likewise noticed that he could not see quite as well with that eye as with the other.

Examination of the left eye showed: small pupil responding feebly to light and accommodation, dilating to only one-half the size of the right when homatropin and duboisin were instilled into both; cortex of the lens opaque, media otherwise clear; disk hyperæmic but not swollen; numerous small hæmorrhages scattered throughout the disk and foveal region of the retina; field limited below; $V.=\frac{6}{XII}$. Examination of the right eye showed: small and responsive pupil; lens opaque in its cortex; eye normal in all other respects.

The knee-jerks were absent. There was no albuminuria.

During the next fifteen months the vision of the left eye slowly deteriorated, until, in December, it was reduced to perception of moving objects in the lower field. The retina gave a dim reflex from the upper periphery, while the rest of the eye-ground was absolutely black, probably from extensive hæmorrhages into the vitreous. The opacity of the lens had increased slightly, the pupil was responsive, tension normal, no pain or injection. The urine had been repeatedly examined with negative result, and the heart was normal in its action. Mr. D. had pursued his usual occupation of inspector of locomotives without interruption, and beyond the loss of vision of the left eye, suffered from no disability.

The treatment was entirely general. I could assign no cause for the retinal and vitreous hæmorrhages other than

weakening of the coats of the retinal blood-vessels and general indications of venous cerebral congestion.

CASE III.—Mrs. W., aged 60, was brought to me by Dr. Frank Woodbury in December, 1893, on account of sudden partial loss of vision of the left eye, discovered accidentally one month previously. At the time of my first examination, $V = \frac{6}{xxxvi}$; there was large, central, irregular outlined scotoma, caused by fresh hæmorrhages in the retina, extending downward and outward from the fovea, and involving the latter. The blood-vessels in that region were, in part, hidden from view by the extravasation, and, where visible, were normal in size and course. The papilla was not inflamed or even hyperæmic, its edges and excavation were well defined. The eye was normal in all other respects. $V = \frac{6}{vi}$ and no disease.

Dr. Woodbury made an exhaustive examination of the physical condition, but was unable to ascribe a cause for the retinal hæmorrhages. The urine showed an excess of phosphates, but no albumin or sugar. The progress of the affection in this case is unknown.

The three cases above recorded have several points in common: the monocular limitation, the insignificant involvement of the optic nerve, the apparently perfect health of the patients, the difficulty of determining a cause, the fruitfulness of treatment, the fact that all had passed middle life, the freedom from complications, and the continued good health for months after the onset of the symptoms. Such cases are properly termed "apoplexy," and not "hæmorrhagic retinitis," are analogous to cerebral apoplexy, and depend, in the majority of cases, upon calcareous or other degeneration of the blood-vessel walls, with or without heart disease. Under ordinary conditions of the daily life, when no unusual pressure is brought to bear on the walls of the vessels, their strength is sufficient; but excitement, anger, grief, shock, constipation, disordered digestion, or any departure from the uneventful routine of existence, is a sufficient cause to determine a rupture of the walls of a retinal vein or artery. The difficulty of determining by the ophthalmoscope a break in the continuity of the vessels

has led to the belief that we are not dealing in these cases with true extravasation but with a diapedesis, and the great number of the splotches of blood, their dissemination, their independence of the proximity of a vessel, and, indeed, their predilection for the neighborhood of the fovea, where the visible vessels are notably scarce, seem to favor this view. It is worthy of remark that, although more than a year has passed since the first observation of the hæmorrhages, and although the disease attacked but one eye, there has been no evidence of increase of tension (glaucoma), nor has any of the patients suffered an apoplexy of the cerebral vessels, of which retinal hæmorrhage is said to be often the forerunner.—*Philadelphia Polyclinic.*

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ORIGINAL ARTICLES.

DISEASES OF THE EYE DEPENDENT UPON GRIP.¹

BY THOMAS R. POOLEY, M.D., NEW YORK.

If it be true that "uneasy lies the head that wears a crown," it is certainly more true that uneasy lies the head that has the grip. *La grippe*, or as we shall designate it in the vernacular, "grip;" for, as the disease itself is vernacular, there seems to be no good reason for adhering to the French when our own language is just as forcible, and means the same thing.

Grip may be briefly defined as a specific, epidemic, self-limited febrile disease, probably dependent upon a bacillus or microbe, as indeed are all other diseases. In fact, we may divide all acute, epidemic and contagious diseases into those in which the bacillus responsible for their existence has been found and those in which it has not yet been found. Certain bacteriologists claim to have found a microbe constant to all the secretions of grip, but have not been able to reproduce it. Periodical outbreaks of grip may be expected whenever favor-

¹Read before the New York Academy of Medicine, March 21, 1895.

able climatic conditions afford an opportunity for the development of the bacillus by which it is caused. We all remember the epidemic which visited New York with such virulence from 1889 to 1891. Early in January, and up to the last month of the present year, the disease was very prevalent in New York, but from January 25 to February 10, it rapidly decreased; and although it still exists, it is by no means as prevalent, and the attacks are not so severe. In London and Berlin, however, the disease is widespread, and the mortality is very large. In Berlin recently, the total number of cases was estimated at from thirty to forty thousand, and in both London and Berlin, it embraced in its list a number of distinguished personages.

During the prevalence of the grip in New York in 1891, a grip symposium was held in the New York County Medical Society, in which short papers were read, and a general discussion ensued. The President, Dr. Fox, asked the writer to take the subject of "The Relation of the Grip to Eye Diseases," and treat of it in a discussion which should last only five minutes. It was found that the space of time allowed would not even permit the enumeration of the diseases which, by a reference to the literature of the subject, had been attributed to the grip. The literature, too, of that epidemic was very voluminous, but a recent search through both the general and special journals shows a great falling off in the number of papers on this subject. As naturally as the hand divides into fingers, or the tree into branches, seems the disposition to account for the occurrence of all diseases—not only of the eye, but other organs as well—by the prevalence of any epidemic. Although it may be admitted that "grip is very versatile in its handling of the human body, and hardly any part of it has been overlooked in making his rounds," it must also be admitted that the evidence of some of the diseases attributed thereto, will be found upon examination, very meagre, and to be more a fashion or a fad than a fact.

In beginning the enumeration of the various affections of the eye, attention may be called first of all to the absurd statement made by some pathologists, that the grip poison first

finds its lodgment in the eye; and if the conjunctiva is in good condition, the chances of an attack are slight. From such an absurd starting point, then, no wonder need be expressed that nearly all forms of inflammatory diseases of the eye, as well as those of the nervous tissues thereof, have been attributed to the grip. It is too well known to need comment or further proof, that very many affections of the eye depend upon other constitutional diseases, and why not then on the grip as well? But, in the various publications of the long list of eye diseases caused by grip, many are totally unsustained by proofs. In this paper, therefore, we shall briefly enumerate the affections of the eye which have been declared to be caused by grip, and seek to show what reason can be adduced for such an assumption, without a tiresome detail of cases, which will, however, be needed to sustain or disprove the cause.

The following diseases of the eye have been described by various authors as due to the grip: Badal² mentions catarrhal and follicular conjunctivitis, blepharitis ciliaris, eczema, hordeolum and inflammations of the sac; Copez, of Brussels, croup and diphtheria; Galezowsky,³ episcleritis; Badal, eruptive and suppurative keratitis, iritis and irido-choroiditis; Guttman,⁴ keratitis denticata; Hosch,⁵ purulent irido-choroiditis; Laquer,⁶ embolic irido-choroiditis and embolism of the central artery of the retina; Hosch, suppurative hyalitis; Adler⁷ and Eversbusch,⁸ acute glaucoma; Fuchs,⁹ Bergmeister¹⁰ and Schapring,¹¹

²Archiv d. Ophthal, 1890, p. 146.

³Reported by Gazis, Rev. d'Ophth., 1890, p. 586.

⁴Berlin Klin. Woch., 1890, v. 111.

⁵Correspondenzbl. f. Schweiz. Aerzte, 1890, p. 163.

⁶Klin. Monatsbl. f. Augenheilkunde, 1890, p. 195.

⁷Wien. Med. Woch., 1890, p. 145.

⁸Münchener Med. Woch., 1890, Nos. 6 and 7.

⁹Wien. Klin. Woch., 1890.

¹⁰Wien. Klin. Woch., 1890, p. 11.

¹¹Medical Record, 1890, p. 679.

suppurative and non-suppurative tenonitis; Valude, phlegmon of the orbit.

The list is taken from that collected by Dr. John E. Weeks, and embodied in a paper on "The Grip as a Cause of Retro-Bulbar Neuritis, and Other Ocular Nerve Lesion," read before the Section on Ophthalmology and Otology, of the New York Academy of Medicine, May 18, 1891. This list might be enlarged, if it could subserve any useful purpose by doing so, but will suffice to show what a number of different forms of eye disease have been described by these authors as caused by grip. This list, as it will be observed, deals only with the inflammatory diseases affecting the various tissues of the eye. It is indeed difficult to imagine the existence of many of these affections during an attack of the grip, except as an accidental occurrence. Among these we may class blepharitis ciliaris, eczema, croup and diphtheria of the conjunctiva, and acute glaucoma. In regard to the latter, however, the writer may merely mention that his colleagues, Drs. Born and Webster, have both recently reported to him orally the occurrence of an attack of acute glaucoma during one of grip; but neither thought the occurrence of glaucoma at this time was anything more than a coincidence. It is well known that any condition of the system that produces debility and depression, favors the outbreak of glaucoma; even grief and sorrow, and the consequent depression, often bring about such a result in eyes predisposed to this disease. The extensive and severe inflammation produced in the upper air passages, and the sinuses which are in more or less direct communication with the eye, such as the ethmoidal and frontal, make it highly probable that not only are simple and purulent forms of disease of the conjunctiva produced by grip, as the frequency with which these forms of conjunctivitis accompanying the disease demonstrate but the severity and location of the severe frontal headaches also point to the probable implication of the accessory cavities. In one case, which occurred to a distinguished surgeon of this city, the frontal sinuses were involved to such a degree as to cause an empyema, which had to be surgically treated. That the

forms of the disease above enumerated are not directly caused by the grip, but are present in most of the cases, there seems to the writer to be little doubt, and it is a question worthy of considerable thought, whether the implication of the accessory sinuses may not even be responsible for the extension of the inflammatory process from thence to the orbit, thus giving rise to the extension of the disease to the tissues, and to the intra-orbital part of the nerve. The implication of the latter, as we shall see, has been explained in quite another way. It seems, too, to the writer not illogical to consider an attack of grip, in some degree at least, responsible for the occurrence of an attack of acute dacryo-cystitis, or phlegmon of the sac, especially in patients subject thereto by stenosis of the duct, or who have had similar attacks. Severe swelling and inflammation of the mucous membrane of the nose and throat induced by this disease are mainly responsible therefor. Such a case the writer now has under care, occurring in a severe attack of grip in a patient who has had such attacks before; but in this, as in most such cases, there existed beforehand either closure or stricture of the nasal duct.

In order to add as far as possible to the practical interest of this paper, it has been the object of the writer to acquire, as far as he could, confirmatory evidence from the experience of others as well as from his own clinical observations, bearing on the occurrence of eye diseases attributed to the grip. These cases have not been hitherto published, but have been kindly sent to him by his colleagues; and it would seem that this line of investigation would be more interesting than a further reference to literature.

In regard to corneal disease being due to this affection, it should be said that we have analogous diseases which have already been put down as giving rise to them; and it is well known that any severe disease which produces a lowering of the nutrition and vitality may be the cause of the various forms of inflammation and ulcer of this poorly nourished structure. It must not be lost sight of that the well-known effects of this disease on the nervous system may act in producing the erup-

tive form of keratitis. Doctor Webster has kindly sent to the writer a case of corneal disease, said to be due to grip, and in the letter accompanying the case, he says he knows it to date from the grip. The following are his notes:

March 8. Patient, male 35 years of age. Three weeks ago had a severe attack of grip, lasting two weeks, with all the usual symptoms, frontal headache and neuralgia being the pronounced symptoms. Among the earlier symptoms were pain over the eye, especially severe over the left orbit. This eye was red, painful, and intolerant of light. The physician in attendance saw a film over the cornea. There was still some circum-corneal injection, photophobia, lachrymation and pain, although only a fading macula of the cornea on the inner side of the pupil marked the site of the former corneal disease. There was no evidence of any herpes of the brow. A few days later, March 11, a case was observed in my own clinic, in a girl of eleven, who had grip about a week before. She was sick in bed for five days. On the first day of getting up, the left eye was red and painful, with marked circum-corneal injection, but no pain, and only slight photophobia. There was well-marked superficial punctate keratitis, consisting in the presence of a number of gray spots over the cornea—in short, such a form as often affects young persons, has been recognized as occurring in conjunction with catarrh of the air passages, and therefore we may assume in the same way, related to grip, in which the catarrh of these passages is so universally present. Any disease which has hitherto been held as liable to happen in such conditions, may be assumed to be due to the grip. In all of the cases collated by Weeks, referring to corneal disease, the forms of the disease were various, and there would seem to be some reason for placing them in causal relation to the grip.

In considering whether any of the suppurative processes mentioned in the list above quoted can be considered as due to the grip, we must admit that if the affections of the conjunctiva are due to the pathogenic agency which gives rise to it, other forms of inflammation are likely to be due to the same

cause, and, as has been shown by Fuchs, the micro-organism described by Klebs,¹² Weichselbaum,¹³ Babies and others, was present in at least one of the cases of tenotomies. But all this requires further proof. The cases of tenonitis referred to by Weeks are the only instances referred to the grip, so far as the writer knows, and need further confirmation. In this list of rare occurrences, too, may be placed phlegmon of the orbit. That inflammation of the uveal tract may occur in many diseases, we have evidence. Suppurative choroiditis, as is well known, not infrequently complicates severe forms of pyæmia and puerperal fever. A suppurative choroiditis, which is likewise of metastatic origin, occurs in rare instances in typhoid fever, cerebro-spinal meningitis, scarlet fever, measles and other diseases, and in which category Fuchs includes influenza, of which grip is only a severe form. It may be in this way, or by a transfer of the inflammation from behind forward from phlegmon in the orbit, and in thrombosis of the orbital veins that we have the uveal tract involved in grip. Since in metastatic affections of the eye, the infecting plug may occur, not only in the blood vessels of the choroid, but also in those of the retina, it is best to comprise, according to Fuchs, this class of cases under the name of "metastatic ophthalmia."

Besides this, the cases which have been already referred to in the literature of the subject, Doctor Joseph A. Andrews has kindly allowed the writer to make use of the following cases, five in number, all occurring in children, and believed to have been related to an attack of the grip. The ages were between seven and nine years. One of the children he saw only once; another several times; and one he still has under observation. In the case now under observation, the family doctor had called the disease with which the child was ill, the grip. It was not, however, a severe attack. When the child was getting better of the grip the eye trouble was noticed. The eye was red and painful—no headache. Seen a month after the

¹²Deutsch. Med. Woch., 1890, p. 140.

¹³Wien. Klin. Woch., 1890, p. 104.

eye was affected, the pupil was contracted, with posterior synechia and circum-corneal injection. Eyeballs sensitive to pressure; also some objective pain; eyeballs soft. When pupils were dilated with atropine, a white, shiny body was seen behind the lens, which had in places a slightly pinkish hue, but no vessels could be made out. It looked like what has been called pseudo-glioma. The child was under observation a month. Only one eye affected; the other normal. There was no other cause for the eye trouble except the grip. Careful inquiry was made on this point. In one case there had evidently been non-suppurative pan-ophthalmitis. The eye trouble had developed during the early stages of convalescence. In the third case, there was irido-cyclitis; the sight was entirely gone. Only one eye was affected in all of the cases. The fourth case was like the first of which I have written. The fifth case was only seen once. The eye was soft, and undergoing phthisis. In this, as in all the other cases, the eye trouble was first noticed during convalescence, and there did not appear to have been symptoms of head troubles during, or subsequent to the attack of grip. All the children had coughs.

Andrews comments upon this most interesting series of cases as follows: Of course, I tried to exclude trauma and other causes than grip, nevertheless other causes may have operated to produce the eye trouble. I do not see why we should hesitate to hold the grip responsible for the complications of which the children I have referred to, furnished illustrations. The same conditions have been recognized very long ago as occurring in measles, typhoid fever, etc.

It is to be hoped that Dr. Andrews will publish these cases in detail. Unless they had been observed by such a painstaking and accurate observer, one might feel inclined to question the accuracy of the observations as to their etiology; but there can be no doubt but that all possible precautions were taken to avoid any error, or overlook any other cause. The fact, however, of so many cases coming under the observation of the same observer in so short a space of time would suggest the possibility of their being due to cerebro-spinal

meningitis. The writer has never seen an example of inflammation of the uveal tract which could be possibly attributed to the grip as a cause, but he does not see why the complication of embolic or metastatic inflammation of this tract may not just as well be due to grip as to any of the other acute infectious diseases of which we have numerous authentic examples, and which are now considered as orthodox¹⁴.

We now approach the consideration of the subject of great interest and importance, and upon which the data that have been collected seem to be more uniform and reliable than in those we have already gone over—the manifestations of grip on the nervous system as they affect the eye, and to which we shall now invite your attention. That grip has a great affinity for the nervous system is shown by its effects on the sensory nerves, producing definite pains experienced in various parts of the body, such as severe pain in the limbs and back, and severe frontal and temporal headaches. The latter pains have not been inaptly described by a humorous journalist as resembling those caused by a "misfit skull." There are also the effects on the nerves of special sense, resulting in the disturbances of taste, smell, hearing and vision; the effects on the motor nerves, giving rise to the paralyses which have been observed; and the effects on the vaso-motor nerves, producing the sensation of chilliness, and later, congestion of the lungs, mucous membranes and other tissues, first by contraction of the lumen of the blood vessels, and later, by vaso-motor paresis.

Although the effect upon the brain and central nervous system has been sufficient to cause temporary insanity, and

¹⁴Since reading this paper a letter from Dr. Alt has been received, in which he says he wrote a short article on Eye Affections After the Grip, in the February number of this journal, 1890. In a discussion two years ago on the same subject in the St. Louis Medical Society, he reported that in the winter of 1892, he saw seven cases like those of Andrews. In three both eyes were destroyed, in the others one eye only. They all happened in children, and they resembled absolutely a metastatic (septic) choroiditis. He adds: "I think that the case published in 1893 or 1894, by Dr. S. Pollak, in this journal, with microscopical examination by myself was of the same nature."

even death, the manifestations which have been noticed in the nervous system are usually in the form of peripheral neuritis. Among the conditions which have been observed, referable to this cause are to be included, peri-orbital and orbital neuralgia, as well as headache of a more general form; paralysis of accommodation, and of the extrinsic muscles of the eye; one-sided ophthalmoplegia, externa and interna; paralysis of the cervical sympathetic of one side, with prominence of the globes; paralysis of the facial; retro-bulbar neuritis and papillitis. Of the almost constant symptoms, orbital neuralgia and migraine, we are all aware, and need not therefore dwell upon them. Whether, however, this is not in part due to the congestion of the accessory sinuses, the frontal and the ethmoid, as well as the affections of the peripheral nerves, is deserving of more attention. Anæsthesia of the cornea has been noticed by Galezowski; Gazis and Bergmeister report the conditions in one eye in some and in both eyes in other cases, and there was complete return of sensibility in a few days. Paralysis of accommodation has been quite frequently observed.

In 1890, in discussing a paper by Dr. Louise Fiske Bryson, read before the Section on the Theory and Practice of Medicine of the New York Academy of Medicine, January 21, 1890, the writer said there had also been noticed paresis of the accommodation, and that such was a noticeable feature in his own case after a severe attack of the grip. In Weeks' paper he quotes two cases which are quite typical, but inasmuch as we have two equally conclusive observations coming under our own notice, we need merely refer to these. One is from the clinic of Doctor Webster, kindly reported to the writer by his assistant, Dr. Blodgett, and here made use of by his permission.

A male, aged thirty-five, grip two years ago, and again three weeks ago. For the last three days complains of blur over everything. Wide pupils. R. V.= $\frac{20}{xx}$; L. V.= $\frac{20}{cc}$; with + 1 D., both $\frac{20}{xx}$. Reads Jaeger No. 1 with + 4 D., at 14 inches. Diagnosis: Paralysis of accommodation from grip.

The other case, one of monolateral paralysis of accommodation, came under the writer's care while he was preparing

this paper. March 11. At the New Amsterdam Eye and Ear Hospital—a male aged thirty-eight; had grip three weeks ago. R. V. = $\frac{20}{XL}$, with +1.25 D. Reads No. 13 at 19 inches. With +4 D., reads No. 1 at 8 inches. L. V. = $\frac{20}{XXX}$, with +.075 D. = $\frac{20}{XX}$; reads No. 1 at $8\frac{1}{2}$ inches without a glass. Diagnosis: Paralysis of accommodation of right eye from grip.

Dr. Andrews has also seen bilateral paresis of accommodation following grip as after diphtheria. In the latter class of cases, the patient has always recovered the use of accommodation. Such observations as those already published, and the facts here adduced, seem to show conclusively the occurrence of paresis and paralysis of accommodation after grip, as also in other acute and chronic diseases, such as diphtheria, typhoid fever, syphilis, and the like. It will also be necessary to carefully exclude the other well known causes, especially before confirming the diagnosis of grip. The fact of this disease affecting the accommodation may also be looked upon as confirmatory of its affecting other nerves, as is shown in the involvement of other branches of the third nerve.

PARESIS OF THE EXTRINSIC MUSCLES.—Paresis of the nerves which innervate the muscles of the eye have been noticed by various authors as among the complications of grip. In a majority of all these cases, there is a sensation of pain in the movements of the eye, and deep seated in the orbit. To these I may add, as in my own experience, a very severe and decided asthenopia is observed on any attempt to use the eyes. That such subjective symptoms as these usually eventuate in a decided paresis, or even paralysis of the muscle of accommodation, as well as of the ocular muscles, is not to be wondered at, as the following facts attest:

Paralysis of the extrinsic muscles has been observed by Badel, who reports two cases as follows:

CASE I.—Male, aged thirty-three; no rheumatism or syphilis. Severe attack of grip with cephalalgia, lasting three or four days. During convalescence patient began to see double. Examination showed paresis of the muscles supplied by the third nerve on the right side, amounting to complete paralysis

of the superior rectus. No mydriasis or loss of accommodation. Recovery took place slowly

CASE II.—Male, aged fifty seven; no rheumatism or syphilis. During recovery from an attack of influenza, which lasted six days, and was accompanied by severe headache, patient saw double when looking at a distance. Examination showed paralysis of the right externus. At the end of five days, the patient only saw double by putting a colored glass before one eye. Recovery was rapid and complete.

As a point of differential diagnosis between paresis of the ocular muscles dependent upon grip and those due to syphilis, the rapid recovery in the former is worthy of note.

Doctor H. S. Oppenheimer found paresis of the inferior rectus in one case in which there was also retro-bulbar neuritis, and which I shall refer to under this head. Uhtoff, from an extract by G. Linn (in *La Semaine Medicale*, 1890, page 30), mentions a case of paralysis of the accommodation complicated with progressive ophthalmoplegia externa, and with symptoms of bulbar paralysis. Grieff reports a case of paralysis of the left sympathetic, enlargement of the left thyroid gland, prominent globes, heart action rapid and irregular in which ptosis of the right upper lid developed.¹⁵

In closing this category of nerve lesions observed as a consequence of the grip, we shall have to include affections of the optic nerve. Neuritis, I believe, was first noticed in this city by Weeks during the epidemic of this disease in 1890, and described by him in a paper read before the Section on Ophthalmology, (loc. cit.). In the discussion which followed the reading of this paper, the present writer remembers to have expressed his doubts as to the case reported being due to the grip; but in view of the many similar observations since made, he is inclined to think that he may have been mistaken in this

¹⁵A similar case has been reported to the writer by Dr. W. E. Chase, of New York, occurring after grip, two years ago. Soon after the patient, female, aged 28, noticed prominence of eyes, which increased for nearly a year, since which time there has been well-marked exophthalmos of both eyes. She is in good health. There is no cardiac trouble and no thyroid enlargement.

opinion, for so many other observers have sustained the view that grip may give rise to both retro-bulbar neuritis and papillitis, and he has also observed one case, yet to be referred to, which could not be attributed to any other cause. Weeks found that the retro-bulbar form of neuritis has been most frequently observed, but that papillitis had been noticed in five cases, of which he gives a brief *résumé*—two by Gazis and three by Guttmann and Vignes.¹⁶ These cases are briefly reported by Weeks. The cases of neuritis were characterized by hyperæmia, œdema and exudation in the vicinity of the disk, and all other causes than grip were carefully excluded. The essential features are referable, therefore, to inflammation of the nerve—neuritis.

Dr. Oppenheimer has furnished the writer with brief notes of two cases of neuritis, and one of retro-bulbar neuritis. The former are as follows: Male, aged thirty five, just recovered from grip with severe cough; has never been ill otherwise. Great ecchymosis of lids and conjunctiva, both ocular and palpebral, which came on over night. Positions of the eye normal, and pupils normal. Left eye, disc hazy; veins greatly enlarged. L. V.=²⁰/_{LXX}; R. V.=²⁰/_{XX}. Diagnosis: Neuritis of left, probably due to bleeding in the sheath of the nerve. No color scotoma.

H. D., male, aged twenty seven; has pain in the muscles of the chest and back from grip. Yesterday he noticed the right eye growing dim. In an around the optic disk of this eye are splashes of hæmorrhage with exudation at the edge of the nerve. Is pronounced by an expert perfectly healthy with perhaps slight anæmia. No Venereal disease. No other sickness since childhood. Vision=¹⁶/_{CC}. Does not drink; other eye normal; no color scotoma.

These cases of papillitis the writer can add one more which has no other ascribable cause than the grip. It occurred in a female, twenty-one years of age, seen in the New Amsterdam Eye and Ear Hospital, January 10, 1895. About three

¹⁶Rev. d' Opht., 1890, p. 402.

weeks before, she had a severe cold, which confined her to bed for three days, with severe pains over the body, and with a cough. She still has the cough and headache. Three days ago, noticed a blur before the right eye. $V.=\frac{20}{1x}$. Ophthalmoscope shows hyperæmia and exudation at the margin of the disc; no color scotoma; other eye normal. Field of vision not taken.

In the other cases reported, no papillitis was found, although it may have existed in the earlier stages of the disease. D'Eperon reports six cases; Bergmeister two; Hansen and Weeks one. In this series of cases, papillitis of an active kind was wanting, and the ophthalmoscope showed either ischæmia of the retinal vessels, or a pallor of the part or whole of the disc, indicative of atrophy, and the inflammatory conditions supposed to be responsible was assumed to be behind the intra-ocular end of the nerve—retro-bulbar. They were moreover characterized, besides loss of vision, by restriction of the visual field, and form and color scotoma. Dr. Andrews says he has never seen papillitis, but he has seen retro-bulbar neuritis dependent on the grip.

The only case of the series which I shall report is the one, the notes of which Oppenheimer has been kind enough to send me:

Male, aged thirty. Felt everything moving before his eyes one afternoon while at work. The next morning he was blind in his right eye. The right eye was prominent and painful when pushed back in the orbit; the pupil was dilated *ad maximum*; the media clear; nerve and retina between the macula and disc, hazy. Vision was $\frac{3}{60}$; no color scotoma. Eye painful on looking upwards, and double vision, due to paresis of the inferior rectus. Diagnosis: Retro-bulbar neuritis. Has just recovered from the grip. No other complaint except great nervousness and a rapid pulse. Denies syphilis, and has no trace of it.

It will be noticed that in nearly all, if not all of these cases the eye affection develops in the latter part of grip, during convalescence, and as in affections of other kinds in which the

eye disease develops, are rather to be considered sequelæ than symptoms of the disease itself. It would seem from the published account of the cases that caution was taken to exclude tabes, syphilis, and other diseases, as well as the abuse of alcohol and tobacco. Weeks thinks that in those cases which he reports, all other factors may be excluded by (1) the large proportion of females affected; (2) the character of the scotoma observed; (3) the sudden loss of vision and the uniform history of its occurrence in grip; (4) the absence of improvement in vision under conditions which uniformly produce such improvement in amblyopia from the abuse of alcohol and tobacco. Still, we must all have in mind how difficult it is to exclude this latter factor.

As a result of the foregoing, it would seem to be warrantable to summarize the following conclusions.

1. That the eye complications following grip are comparatively rare—a fact which becomes apparent when we remember the immense number of cases of grip which have occurred during the past five years, and the exceedingly small number of cases of eye trouble reported.

2. Many of the cases reported as due to the grip are fanciful, and need more substantial proof.

3. Grip may affect the eye by inflammatory process, or by invasion of the accessory sinuses.

4. It may affect the nervous tissues.

5. The inflammatory affections involve especially the conjunctiva, the uveal tract, tissues of the orbit, and perhaps the fibrous capsule of Tenon.

6. In some of these cases the extension is by continuity, and in others by metastatic or embolic processes.

7. The nervous apparatus of the eye is especially liable to become involved by paresis of accommodation or of the extrinsic muscles of the cervical sympathetic, by papillitis and retro-bulbar neuritis, and also anæsthesia of the cornea.

8. Before assigning the grip as a cause of any of the eye complications enumerated, careful and thorough scrutiny are necessary to exclude other causes, especially in affections of the nervous tissue—syphilis, tobacco, alcohol, etc.

EDITORIAL NOTICE.

AN ACT FOR THE PREVENTION OF BLINDNESS IN CHILDREN.

On March 6, 1895, the Missouri State Legislature adopted the following bill:

Be it enacted by the General Assembly of the State of Missouri, as follows:

SECTION 1. Should one or both lids of either eye or of both eyes of an infant become red or swollen, or should there be any discharge from either eye or from both eyes, at any time within three weeks after its birth, it shall be the duty of the midwife, nurse, or other person having charge of said infant, at once, unless for good cause shown, to report the condition of said eyes to a legally qualified practitioner of medicine.

SECTION 2. Every health officer shall furnish a copy of this act to each and every person who is known to him to act as midwife or nurse, in the city or town for which such health officer is appointed; and the Secretary of State shall cause a sufficient number of copies of this act to be printed, and shall supply the same to such health officers on application.

SECTION 3. Any failure to comply with the provisions of this act shall be a misdemeanor, or shall be punishable by a fine of not less than ten and not more than one hundred dollars, or by imprisonment not to exceed six months, or by both such fine and imprisonment.

SECTION 4. All acts and parts of acts inconsistent with this act are hereby repealed.

By the enactment of this law Missouri has fallen into line with her sister States of New York, Maine, Rhode Island, Ohio, Maryland and Minnesota. The rapidity and unanimity with which this bill was carried through both Houses of the Legislature is due to the personal efforts and untiring energy of Dr. H. M. Post alone. We desire to congratulate him and the State on this happy result.

SOCIETY MEETINGS.

AMERICAN MEDICAL ASSOCIATION.

SECTION ON OPHTHALMOLOGY.

The annual meeting of this Association will be held in Baltimore, May 7-10, 1895.

OFFICERS OF SECTION.—Chairman, Edward Jackson, Denver, Colo.; Secretary, H. V. Würdemann, Milwaukee, Wis.; Executive Committee, J. L. Thompson, Indianapolis, Ind.; S. D. Risley, Philadelphia, Pa.; A. R. Baker, Cleveland, Ohio.

The limits of time allotted, are ten minutes for the reading of a paper, and five minutes for remarks in discussion.

The annual dinner of the Section will take place on Tuesday evening; price, two dollars. Those who expect to be present are requested to notify Dr. Hiram Woods, 816 Park Ave., Baltimore, Md.

The Volume of Transactions of the Section will be forwarded to all who will send the Secretary one dollar with full address.

PROGRAM.—TUESDAY, 3 P.M.

1. Address of Chairman: The Strength of the Different Mydriatics and Myotics. Edward Jackson, Denver, Colo.
2. Incipient Cataract, A. R. Baker, Cleveland, Ohio.
3. Operative Treatment of Immature and Some Forms of Zonular Cataract. J. E. Woods, New York.

4. The Operation for Secondary Cataract. J. H. Thompson, Kansas City. Discussion to be opened by Boerne Bettman, Chicago, Ill.; J. A. White, Richmond, Va.; Geo. E. Frothingham, Detroit, Mich., and Hermann Knap, New York.
 5. Practical Points in Anæsthesia for Plastic Operations About the Eye. M. W. Zimmerman, Philadelphia, Pa.
 6. The Restoration of the Eyelids with Sliding Flaps. W. C. Tyree, Kansas City, Mo.
 7. Blepharoplasty Without Pedicle. Eugene Smith, Detroit, Michigan.
 8. Transplantation of Skin in Plastic Operations on the Eyelids. Walter B. Johnson, Paterson, N. J.
 9. Skin Grafting in Ectropium and Entropium. F. C. Hotz, Chicago, Ill.
 10. Transplantation of a Strip of Skin into the Intermarginal Space of the Lids. Herman Knapp, New York.
 11. Some Cases of Restoration of Eyelids by Plastic Operations, with exhibition of patients. Robert Harlan, Baltimore, Md. Discussion opened by R. A. Reeve, Toronto, Canada, and Swan M. Burnett, Washington, D. C.
- Annual Dinner of the Section, 7 P.M.

WEDNESDAY, 9 A.M.

12. A New and Almost Bloodless Enucleation Operation. B. Bettmann, Chicago, Ill.
13. Evisceration of the Eyeball. L. Webster Fox, Philadelphia, Penn. Discussion opened by S. D. Risley and G. O. Ring, of Philadelphia, Pa.
14. Histological and Bacteriological Notes on Some Cases of Penetrating Wounds of the Eyeball with Experimental Observations on Certain Bacilli Found in a Case of Post-Operative Panophthalmitis. Dr. G. E. DeSchweinitz, Philadelphia, Pa. Discussion opened by R. E. Randolph, Baltimore, Md., and H. Gifford, Omaha.

13. A Clinical Study of the Ulcerative Diseases of the Cornea. S. D. Risley, Philadelphia, Pa. Discussion opened by C. J. Kipp, Newark, N. J.
16. Hæmorrhage into the Retina and Vitreous in Young Persons Associated with Evident Disease of the Retinal Blood-Vessels. Remarks on the Formation of Vessels into the Vitreous and in a Case of Emigrating Subhyaloid Hæmorrhage. Harry Friedenwald, Baltimore, Md.
17. Prognostic Significance of Albuminuric Retinitis. E. Oliver Belt, Washington, D. C.
18. Extensive Colloid Changes in the Choroid, With Report of Cases. J. T. Carpenter, Jr., Philadelphia. Discussion opened by G. E. DeSchweinitz, Philadelphia, and R. W. Gilman, of Detroit, Mich.

WEDNESDAY, 3 P.M.

Report of Nominating Committee and election of officers.

19. Historical Notes on Operations on the Ocular Muscles. T. B. Schneidemann, Philadelphia, Pa.
20. The Technique of Tenotomy of the Ocular Muscles. L. Conner, Detroit, Mich.
21. The Slight Effects Sometimes Produced as the Result of Free Tenotomies of the Ocular Muscles for Heterophoria. S. Theobald, Baltimore, Md.
22. The Limitations of Tenotomy of the Ocular Muscles. H. F. Hansell, Philadelphia, Pa.
23. Tendon Advancement with a Special Indication for Its Employment. C. H. Thomas, Philadelphia, Pa.
24. The Indications for, Advantages and Technique of, Muscle Shortening. G. C. Savage, Nashville, Tenn. Discussion opened by Geo. T. Stevens, of New York; J. L. Thompson, of Indianapolis, and S. D. Risley, of Philadelphia, Pa.
25. Strabismus. C. M. Hobby, Iowa City, Iowa.
26. To What Extent Should Recently Suggested Methods of Muscular Exercise Displace Tenotomy in the Treatment of Heterophoria? Hiram Woods, Baltimore, Md.

27. Practical Points Gained in the Treatment of 1000 Cases of Insufficiency of Ocular Muscles. J. W. Park, Harrisburg, Pa.
28. Hysterical Affections of the Eye Muscles. H. Gradle, Chicago, Ill.
29. Some Remarks on Paralysis of the Superior Rectus Muscle. Ed. J. Bernstein, Baltimore, Md. Discussion opened by J. F. Fulton, St. Paul, Minn.; L. Conner, Detroit, Mich., and S. Theobald, Baltimore, Md.

THURSDAY, 9 A.M.

30. Report of Committee on Legislation for the Prevention of Blindness. Lucien Howe, Chairman, Buffalo, N. Y.
31. Some Rare Cases of Infantile Purulent Conjunctivitis. A. A. Hubbell, Buffalo, N. Y. Discussion opened by B. Alex. Randall, Philadelphia, Pa.
32. Retrobulbar Tumor. S. C. Ayres, Cincinnati, O. Discussion opened by J. A. White, Richmond, Va.
33. A Case of Enchondroma of the Cartilage of the Upper Lid. P. D. Keyser, Philadelphia. Discussion opened by F. C. Hotz, of Chicago.
34. Report of a Case of Traumatic Varix of the Orbit in Which Ligation of the Left Common Carotid was Performed. C. A. Oliver, Philadelphia. Discussion opened by R. A. Reeve, Toronto, Canada.
35. The Infiltration Method of Anæsthesia in Ophthalmic Practice, with Demonstrations. H. V. Würdemann, Milwaukee. Discussion opened by Harry Friedenwald, Baltimore, and Carl Koller, New York.

THURSDAY, 3 P.M.

36. Report of Committee on the Examination and Care of the Eyes During School Life. B. A. Randall, Chairman, Philadelphia; W. F. Southard, San Francisco; H. B. Young, Burlington, Iowa; A. R. Baker, Cleveland, and

George H. Price, Nashville. Discussion opened by Peter A. Callan, New York; James P. Parker, St. Louis, and S. D. Risley, Philadelphia.

37. Twenty-five Hundred Cases of Ocular Headache and the Different States of Refraction Connected Therewith. W. F. Mittendorf, New York.
38. A Study of the Refraction of 1500 Eyes. H. Bert. Ellis, Los Angeles, Cal.
39. Anisometropia. W. F. Southard, San Francisco.
40. The Percentage of Symmetrical and Asymmetrical Meridians of the Cornea in Astigmatic Eyes. S. D. Risley, Philadelphia, J. L. Thorington, Philadelphia.
41. Latent Astigmatism. H. M. Starky, Chicago, Ill.
42. On the General and Local Conditions that Change Corneal Curvatures. L. J. Lautenbach, Philadelphia, Pa. Discussion to be opened by T. E. Murrell, St. Louis; W. H. Wilder, Chicago; Edward Jackson, Philadelphia.

FRIDAY, 9. A.M.

43. Ectopia Lentis. Flavel B. Tiffany, Kansas City. Discussion to be opened by Harold Gifford, Omaha, Neb.
44. The Use of Prisms to Increase Vision in the Formation of New Maculæ in Conical and Leucomatous Cornea, etc. G. M. Gould, Philadelphia, Pa. Discussion opened by T. H. Fenton, Philadelphia.
45. Observation Upon the Eye of the Negro with Special Reference to the Refraction, Ocular Muscles and Color Vision. C. T. Kollock, Charleston, S. C. Discussion opened by Swan M. Burnett, Washington, D. C.
46. Ophthalmoplegia Interna. B. L. Milliken, Cleveland, O. Discussion opened by H. V. Würdemann, Milwaukee.
47. The Relation Between the Eye and the Brain. J. A. Lydston, Chicago, Ill. Discussion opened by R. F. LeMond, Denver, Colo.
48. Anomalies in Ophthalmic Practice. A. C. Corr, Carlinville, Ind. Discussion opened by S. L. Ziegler, Philadelphia, Pa.

49. Formalin as a Preservative Agent for Eye Specimens.
W. H. Wilder, Chicago, Ill. Discussion to be opened
by F. C. Hotz, Chicago, Ill.
50. A New Keratometer. D. S. Reynolds, Louisville, Ky.
Discussion to be opened by Geo. H. Price, Nashville,
Tenn.

REVIEWS.

UNGARISCHE BEITRÆGE ZUR AUGENHEILKUNDE (HUNGARIAN CONTRIBUTIONS TO OPHTHALMOLOGY). By PROF. W. SCHULEK. Vol. I. With 45 illustrations. Leipzig and Wien: Franz Deuticke. St. Louis: J. H. Chambers & Co. 1895.

This volume, which typographically is made up in the best manner, contains a number of various articles by Professor Schulek, of the University of Budapesth, and his pupils. It is very interesting reading and shows that the Hungarian oculists are striving hard to do original work. Perhaps, the most interesting parts are the articles on attempts to improve the surgical means at present at our command, although we may not agree with his ideas.

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FUENF UND ZWANZIGJÄHRIGER BERICHT UEBER DIE AUGENHEILANSTALT (Twenty-fifth Report of the Eye Hospital). By J. HIRSCHBERG, Prof. Extraord. at the University of Berlin. Berlin: R. Friedlaender & Sohn. St. Louis: J. H. Chambers & Co. 1895.

This short but immensely interesting report of the work done by the author and his pupils, is a most interesting and instructive one. Its main chapters are those on cataract extraction, glaucoma and foreign bodies in the vitreons. Hirschberg is an ardent supporter of cataract extraction without iridectomy and says that he sees no more cases of prolapse of the iris, than after operations with iridectomy. His is not afraid of subsequent secondary glaucoma after such a prolapse has happened, which tallies with our own experience.

ALT.

SELECTIONS.

SOME REMARKS ON EROSIONS AND ULCERS OF THE CORNEA AND THEIR TREATMENT.¹

BY CARL KOLLER, M.D.

It is not intended to give here a complete study of this interesting and important subject, but only to emphasize the general principles according to which corneal lesions have to be treated; besides, I shall mark out some points which personal experience has taught me to be of importance.

In dealing with corneal affections we must keep before our mind the peculiar anatomical and physiological attributes of the cornea; that it is a thin membrane without blood-vessels, but profusely furnished with nerve ramifications, covered on one side with epithelium continuous to that of a mucous membrane, on the other side with an endothelium; that it receives its nutrition from two different sources—in its upper layers by lymph currents fed from the conjunctival blood-vessels, and in the deeper strata from those tributary to the anterior ciliary blood-vessels. If we add that the high polish necessary for its function, protection from evaporation, is required and furnished by a constant irrigation with a salty fluid produced by the tear glands, the peculiar position of this structure is indicated. It is not necessary to dwell at length upon the great importance of maintaining the transparency and curvature of this precious little membrane in order to understand why every affection, even the smallest epithelial erosion, deserves our most earnest attention.

¹Read before the Manhattan Medical and Surgical Society, January 26, 1895.

Every corneal erosion or ulcer, with the exceptions to be mentioned, demands the application of a well-fitting *bandage*; the popular eye patch or the dark eye glasses do not serve the purpose. The bandage ought to keep the lids closed without exerting pressure upon the eyeball. The closing of the lids prevents their rubbing on the ulcer with every movement, thus irritating it and causing pain. Furthermore, closing of the lids keeps dust out from the ulcer which is sure to gather there, being protected in the recesses from the cleansing action of the flooding tears. Anybody who has witnessed the immediate relief experienced by a patient with corneal ulcer or erosion after proper application of the bandage will be convinced that this is the right kind of treatment. In progressive ulcer with threatening perforation of the cornea the bandage serves yet another purpose. If the cornea at the place of the ulcer is thinned down to the point where a violent movement—coughing, sneezing, pressing for stool by a sudden increase of pressure—will rupture it, the aqueous humor will flow out with a rush, the iris will prolapse to a larger extent, and by the sudden emptying of the chamber the lens may become dislocated. If, on the contrary, the eye is supported by a semi-elastic bandage the perforation will occur in a more easy way: the aqueous humor, instead of rushing out, will flow off gently; the iris, instead of prolapsing, will only lay itself before the little hole, so that the ultimate result will be only a small adhesion instead of an extensive one with all its possible consequences. Of course, bed-rest will greatly contribute to this more favorable development.

The bandage should be changed at least once a day. Corneal ulcers and erosions are mostly accompanied by some conjunctival irritation with discharge, and to remove the latter, change of the bandage and cleansing of the eye is necessary. Where the discharge is more copious it precludes the use of the bandage altogether, since the latter would be conducive to locking up of the secretion, a condition most unfavorable for the healing of corneal ulcers. The use of a bandage, therefore, is precluded in corneal ulcers arising in gonorrhœic oph-

thalmia, in trachoma, and even in the marginal ulcers occurring in chronic conjunctivitis of old cachectic people. It can be dispensed with in the lighter forms of ulcer from phlyctenular keratitis which are the rule in this country, whereas the extended, progressive, and deep, frequently perforating ulcers, very common among the poorer classes of large European cities, require different treatment.

Another measure of very great importance and fit for almost all cases of inflammatory trouble of the cornea is the use of *hot poultices*. The beneficial effect of such can not be too highly commended; it is well founded in theory and proved in practice. The corneal tissue, being devoid of blood-vessels, lacks the means of defense which other tissues possess against necrotizing influences, in the increase of blood supply. A more liberal supply of lymph circulation will take the place that arterial congestion takes in the process of demarcation of necrosis in other tissues. On the other hand, in the healing stage of an ulcer it will promote the forming of cicatricial tissue. To serve their purpose the poultices must not be made continuous; continual heat paralyzes the blood-vessels as continuous cold does. I generally recommend making them four times a day for an hour, and just as hot as the patient can bear them, changing the compress about every minute or two. The compress must not be too thin to keep a sufficient amount of heat, and must cover a part of the forehead and cheek. If properly made, the eye looks congested and the skin of the forehead and cheek shows a deep red. The patients always feel very much relieved by these hot applications, and, if anything, have to be cautioned not to overdo their use. In the intervals the eye is bandaged.

The *use of atropine* may be advisable, but it has its strict indications, and the indiscriminate instillation of atropine in every kind of corneal ulcer may be condemned. Generally atropine is useful where there is great irritation and much congestion in the case of erosions or ulcers of a central location on the cornea. Strictly speaking, atropine has in ocular therapeutics one chief indication—that is, to dilate the pupil when

iritis is present or threatening. Now, it happens, or rather lies in the nature of things, that this latter indication exists only in lesions of a central location on the cornea. Every corneal lesion is followed by a congestion of the corresponding part of the ciliary system of blood-vessels; so we see in a more peripheral location of the lesion only the corresponding sector of the ciliary system congested; but in central lesions the whole ciliary system all around the cornea is filled and gives rise to the well-known pericorneal injection. The same system of blood-vessels—the anterior ciliary arteries—are the chief blood supply of the iris, hence we see in every case of ciliary congestion the iris congested also and the pupil tending to become narrow, which latter is a purely mechanical phenomenon. In case of an infected ulcer the congestion of the iris just described may turn into real iritis. The view is borne out by the fact that we hardly ever see iritis follow a corneal ulcer peripherally located. If the atropine is useless, except where it fills an indication, it may be even harmful, making the ciliary blood-vessels anæmic, thus lessening the lymph circulation and retarding the healing. The objection would not hold good against the general use of *eserine*, which a number of years ago was very popular in corneal lesions, and which would seem to serve similar ends as the hot applications—that is, to cause congestion of the ciliary system in the service of better nutrition. But the use of the *eserine* entails just the dangers which in many cases of corneal ulcer we have to combat—that is, complication with iritis, and, as far as I am aware, it is nowadays very sparingly used in corneal affections. There exists only one single indication for the use of *eserine* in corneal ulcers, and that is the case of a threatening perforation of an ulcer located at the corneal periphery. In such a case a contracted pupil may be very desirable to make the prolapse of the iris as small as possible if it does appear.

The use of *cocaine* as an *anodyne* in painful ulcers and erosions of the cornea is very common, but can not be justified either by practice or by theoretical considerations. The anæsthesia produced by cocaine instillation lasts a very short time

—hardly ten minutes—and the reappearance of sensation is accompanied by the reappearance of pain, so that the instillation would have to be almost continuous to be efficient. But this would be the slightest objection. It can be shown that the use of cocaine in corneal affections is positively harmful. Cocaine is a general protoplasmic poison, as more recent biological researches have proved; it first stimulates the protoplasm and afterward paralyzes it, prolonged and repeated action causing finally mortification. It is very easy to demonstrate that repeated instillation of cocaine into an eye causes a general slight haziness and dotted erosions of the corneal epithelium. I noticed these phenomena in my first experiments with cocaine, and was at first inclined to ascribe them to dryness and evaporation, due to arrested secretion of tears and diminished winking of the lids brought on by the local anæsthesia. But a series of experiments undertaken on rabbits established beyond doubt that although dryness plays some part in the haziness and exfoliation of the epithelium, it is chiefly due to necrosis of the epithelium brought on by the direct action of cocaine. Comparison with the physiological effect of other substances with local anæsthetic properties, like erythrophlæine, leads to the same conclusion. A direct proof for this view is furnished by the experiments of Albertoni on the action of cocaine upon the vital functions and movements of ciliated epithelium, spermatozoids, and various protoplasmic cells of the lower forms of life. As in the treatment of corneal ulcers it is our task to fortify and enhance the vitality of the corneal tissue, we must abstain from the use of cocaine, which is liable to lower it.

As our means of checking the progress of an infected corneal ulcer, besides the operation of paracentesis, in some cases the actual cautery is very much in favor, and justly, for since its introduction by Gayet many an eye has been saved that formerly was lost; with the use of cocaine the application of the cautery is entirely painless, and in fact its more extended use began with the introduction of cocaine as an anæsthetic. The actual cautery, however, has also its limitation, and it is

by no means a panacea. One great objection is that to be efficient very much tissue must be destroyed—possibly more than when the demarcation would be natural. On the other hand, it is not a very rare occurrence that an ulcer, after cauterization has apparently stopped its progress, resumes its destructive stage again. The explanation for such is not difficult to find. The cautery, even if applied very liberally into apparently healthy tissue, will in many cases fall short of destroying every part of the infected area; besides, the source of infection is frequently in the conjunctival sac or in the lachrymal cyst, whence the most copious antiseptic irrigations can not eradicate it. The eschar produced by the cautery may be entirely sterile, but it forms a good nest for the germs of suppuration; and so we see in some cases the infection resume its course after a short stay and destroy what there is left of the cornea. The desideratum for progressive infected ulcer would be a remedy capable of diffusion into the corneal tissue and acting in an eclectic manner, destroying the germs of infection and sparing the tissue. To some degree tincture of iodine seems to act in this way. It is surprising how well the cornea stands the application of the strong tincture if properly executed, and how quickly sometimes progressive ulcers are brought to healing. One case has impressed itself very strongly on my mind. A man, sixty-nine years of age, unusually short of stature and rather decrepit, presented himself with one of those crescent-shaped ulcers on the inner margin of his right cornea, which before the introduction of the actual cautery, were considered incurable and which bear the very fitting name *ulcus rodens*, first given them by Mooren. If not stopped, such ulcers travel over the whole cornea, progressing with an undermined margin on the concave side of the crescent and cicatrizing on the convex side of it. They never lead to perforation, but never stop spontaneously until the whole cornea is converted into an opaque scar. To make them more dreaded still, they affect in most cases both eyes in succession. I applied the galvano-cautery, using besides other suitable measures; however, that stopped the ulcer only for a few days. The

margin became infiltrated again, and the use of the cautery was repeated. Within four weeks I had resort to it four times, during which time the ulcer became larger, while the remaining part of healthy corneal tissue was reduced to a very small spot, almost surrounded entirely by the ulcer. Now a similar infiltration showed itself at the inside of the left cornea. Unwilling to bear the responsibility any longer alone, I proposed a consultation with another oculist. He also advised the use of the cautery. So I cauterized both eyes, being very little hopeful of the result, my patient being almost desperate. After a few days the infiltration of the margin showed itself again in both eyes. I decided not to repeat the use of the cautery and tried tincture of iodine, which I had used before in minor cases. I applied it once every day; within a week the ulcers were rapidly recovering and after two more weeks were completely healed. The patient has very good vision in both eyes, even in the first attacked, the healthy remainder of the upper strata of the cornea having been drawn back into its former position by cicatrization like a shrunken flap of the skin, gaining considerably in size.—*New York Medical Journal*.

OBITUARY.

JOHN WHITAKER HULKE. +

1830 TO 1895.

J. W. Hulke was the descendant of a Dutch family who for the sake of their religious belief fled from Duke Alba to England. His father was a much admired surgeon at Deal and together with his son, treated the Duke of Wellington in his last illness (1852).

J. W. Hulke first studied for two years in Germany. He was one of the few of the older London school whom I found able to converse in German. He then entered King's College in 1849, and was later on Bowman's assistant, and Ferguson's; then assistant surgeon of the English Army in Smyrna and at Sebastopol; in 1857, Fellow of the Royal College of Surgeons and Surgeon to Moorfields Hospital. Here, besides Bowman and Critchett, he was soon one of the leading men. In 1877 I had occasion to admire his acuteness, his operative art and his knowledge of anatomy. His chief works are in the line of microscopical and comparative anatomy of the eye; his monograph on the ophthalmoscope won the Jackson prize. He was a many-sided investigator; he did excellent work in palaeontology; he delivered the Arris and Gale lectures on Surgery in the Royal College of Surgeons; in 1862 he was appointed Surgeon to the Middlessex Hospital, and in 1890 was elected President of this renowned Society. He took an active part in the scientific examinations and in the assistance to the blind poor. Whosoever, had occasion to meet him, will surely honor him in memory.

The titles of his chief works, as far as they interest us,

were: A practical treatise on the use of the ophthalmoscope, London, 1861; On the morbid changes of the retina, anatomy of the retina in amphibia and reptiles, Proceedings of the R. S. 1865; Anatomy of the chameleon's retina, Phil. Tr., 1866; Fovea centralis of the human retina, Ibid., 1867; Glaucoma and its surgical treatment by iridectomy. Furthermore articles on Aneurism of orbit; Astigmatism; Colloid disease of the orbit; Cysts of the iris; Glioma retinae; Sarcoma of the choroid; Optic neuritis.

A. WALDAU. +

Dr. A. Waldau, G. S. R., died in Berlin on March 8. He was, with Michaelis and Arnot, one of those friends of the young A. v. Graefe, who later on became his first assistants. In Graefe's clinic he gave a cursus on operations and he used to assist the chief in his operations. Aside from his dissertation (On the disturbances of the motility of the eyes 1858), he published a monogram—On the removal of the cataract with a spoon, which, to-day, is only of historical value. A ray of von Graefe's genius lighted on him.—J. HIRSCHBERG, (*Centralblatt f. Augenheilkunde*).

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ORIGINAL ARTICLES.

CONGENITAL FISTULÆ OF THE LACHRYMAL SAC.

BY DUNBAR ROY, M.D., ATLANTA, GA.,

Professor Ophthalmology and Otology in Southern Medical College.

In the *Archives of Ophthalmology* Vol. XXIII, No. I, occurs a short article from the pen of Dr. Casey A. Wood, of Chicago, entitled "Congenital Bilateral and Symmetrically Placed Fistulæ of the Lachrymal Sacs;" in which he reports a case of this rare affection and the same time calls attention to the fact that the number of such cases recorded in the literature is extremely rare. From the investigation of the literature at my command, I fully agree with this latter statement. From the article of Dr. Wood's, we ascertain that Prof. Manz, "considers it at least doubtful whether there is such a thing as congenital fistula of the sac, but admitting its possibility would regard it as an arrest of development, an imperfect closure of the groove which in the embryo runs from the eye to the olfactory pit."

Dr. Wecker has mentioned cases in his "Treatise on Ophthalmology" as occurring in the practice of Beer, Scarpa and others, and says that the openings were capillary in character, the lachrymal fluid appearing only during the act of crying, or when pressure was made upon the sac.

Hartridg has also mentioned a case of "Double Lachrymal Fistula," but the details of the report were very imperfect.

Dr. Wood mentions the fact that only perfect and trustworthy report of such a case was recorded by Aynew, of New York. The fistulæ, similarly situated at the lower end of both lachrymal sacs, occurred in a three year old child apparently healthy, with no other congenital defect and who had suffered with no previous inflammatory affection of the eye.

Dr. Wood's case was that of a man, 36 years old, who complained of no ocular symptoms except a slight accommodative asthenopia. When he was 18 years of age, he was treated for an abnormal opening in either tear sac.

Under treatment by syringing out the sacs, probing, the use of glasses and better care of the eyes, the lachrymation almost entirely ceased, returning only when driving in the wind or on exposure during cold weather. By examination a minute opening was found at the lower extremity of each lachrymal sac into which a No. 1 Bowman's probe could be passed. The patient had never noticed any discharge from these openings save the natural lachrymal secretion. The openings however were found to be puckered seemingly due to the formation of cicatricial tissue.

To this number already mentioned I wish to add another case which recently occurred in my own practice.

Mary M., colored, age 14; presented herself at the Eye Clinic of the Southern Medical College, on account of "increased tears" in the eyes, but mainly on account of the burning and gritty sensation which was referable to the lids. The patient gave no history of a previous inflammation about the eyes or palpebral surfaces, and so far as could be ascertained the past history was free from any ocular trouble.

On examining the palpebral conjunctiva a marked case of

follicular catarrh could be seen especially marked at the outer canthi. An application was made to this condition and the patient about to be dismissed, when my assistant called attention to two little beads of water which were present upon symmetrical spots on each side of the nose. Upon further examination I discovered two minute fistulæ of the lachrymal sacs, situated in exactly symmetrical positions at the lower portion of each sac and each opening blocked with a minute head of clear fluid.

On inquiry from the mother, I ascertained that water had been running out of these little spots ever since she could remember. With the exception of the present conjunctival trouble the child had never experienced any inconvenience. On pressing upon the sacs, clear lachrymal fluid would exude through these openings without any signs whatever of mucous or pus. The openings admitted with difficulty a No. 1 Bowman's probe, with which no exposed or roughened bone could be detected. The puncta were freely patulous. I explained to the mother what would probably have to be done, requesting her especially that the child be brought back, but as was anticipated, an act proverbial to the colored race, the patient has never returned. The case is interesting from the fact that the evidence of its congenital character is borne out by the history of the case and also from the lack of any evidence of catarrhal trouble within the lachrymal ducts. The nose was carefully examined without finding anything abnormal enough to account for a stenosis of the lower portion of the canal. The introduction of a probe was so painful that I did not make any strenuous endeavors in that direction.

Another point I wish to mention here although somewhat of a digression and that is the presence by no means infrequently of trachoma among the colored race. One sees mentioned quite frequently in text-books and other articles that trachoma among the colored race is very rare, the truth of which assertion seems to be dependent upon an article written several years ago by Dr. Swan M. Burnett, of Washington, in which he gave his clinical experience as vouching for the truth

of this statement. While I do not deny for a moment the truth of this assertion as stated by Dr. Burnett, from his experience among the colored race in his own district, I do deny that it is universally applicable to the colored race all over the South. I make this assertion from my own individual experience here in a city where at the head of a large clinic, I have had opportunity to verify the truth of the same. This experience I think will coincide with that of other oculists in our city, and while I do not make the statement as applicable to every portion of the South, I do think that the frequency of trachoma among the colored race must largely depend upon the locality in which they dwell.

In making this statement, I wish to add a corollary to the effect that true trachoma is not near so prevalent among any class of people in the South, as will be found in the Northern and European cities. In other words with us true trachoma is not very frequent, but when it does occur it is almost equally prevalent among the colored and among the white population. But these latter sentences are entirely foreign to the caption of this article and in future I wish to treat of some of the especial manifestations of ocular troubles among the colored race.

A CONTRIBUTION TO THE EXPERIENCES IN REMOVING THE LENS IN HIGH-GRADE MYOPIA.

BY ADOLF ALT, M.D., ST. LOUIS.

Among a small series of cases in which I proposed, and the patients allowed, the removal of the clear crystalline lens with the object of—so to speak—curing their high-grade myopia and which have convinced me, that in the proper cases this is a well warranted and admirable procedure, I had one case, the history of which is of more than common interest.

Ch. H., an immensely overgrown boy of 17 years, all bone and skin, and with a strangely small head, came to consult me March 4, 1890. I found a myopia of 20 D. and astigmatism of 2 D.; slight dislocation of both lenses downwards and considerable choroidal changes in both eyes, to which were added a few old chorio-retinitic patches in the right eye. With the correcting lenses, which by the way rendered his nose continually sore on account of their weight, his vision was but R.= $\frac{18}{cc}$; L.= $\frac{6}{cc}$. He could not attend any school and felt so useless in the world that he, as well as his family, entreated me, as they had done to others before, to do something for him. Having knowledge of a case in whom Dr. Weber, of Darmstadt, Germany, had many years previously rendered a highly myopic eye almost emmetropic by removal of the lens, I spoke of this as the only possible way, in which an improvement might be produced. Yet, on account of the extensive choroidal changes, I did not dare to perform the operation. I told the patient, however, that it was probable that the dislocation of the lenses would increase and that it might produce symptoms which would encourage me to make the trial on one eye.

On May 10, 1892, he called on me again. The lenses had both sunk far enough downwards to allow of their upper margin being just seen in the undilated pupil. He complained of continued pain particularly in the right eye, which showed ciliary injection and felt slightly harder than the other. I ordered rest and eserine instillations, and on May 25, when the inflammatory symptoms and pain had been gone for about a week, I very cautiously needled the right anterior lens capsule. Without any symptoms of inflammation, not even irritation, the lens grew more and more dim. On July 11, I needled it again and on September 13, for the last time. A month after this he had vision $\frac{20}{L}$ in this eye without any glass; he also refused any cylinder. He read Sn. 1 easily at 10 inches with +2.75D. This condition has remained unchanged ever since. He has been going to the day- and night-schools to fit himself for business and for a year has filled positions which gave him employment partly out of doors and partly at the desk. In fact, the improvement of this eye is so enormous, that it has made a new man of him. In the exuberance of his joy he wrote me, that he would willingly go blind, if necessary, for having enjoyed his present vision, if but for a year.

The case has, however, besides this highly brilliant one, also a shady side.

On November 11, 1892, the success with the right eye prompted me to needle the left lens also. Nothing suspicious followed this and the second needling. Yet, while the lens substance gradually melted away, the field of vision became very much reduced on the nasal side and finally when there was a sufficiently pupil to inspect the interior of the eye on January 6, 1893, the outer half of the retina was found to be detached. This eye is, therefore, worse off than it was before the attempt to improve it.

Luckily, the patient is still so elated at the success with the right eye, that the loss of the left one appears to him to be of little account.

Fukala and others have warned against such operations in eyes with considerable choroidal changes. I have always

thought that this warning was not quite warranted by facts; yet in this special case it kept me from attempting the operation, until I thought myself forced to do something on account of the increasing laxity of the zonule of Zinn. I suppose a differentiation should be made between choroidal changes due to stretching alone and to such changes combined with adhesive inflammation. While in the former the danger from the operation may be greater, I think in the latter cases the adhesive chorioretinitis is, perhaps, rather an insurance against detachment of the retina. This, also, is the only way in which I can explain the divergent results in these two eyes.

PARESIS OF THE OCULO-MOTOR NERVE IN COMBINATION WITH ACUTE PNEUMONIA.

BY ADOLF ALT, M.D., ST. LOUIS.

In the February number of this journal a case of paresis of the abducens nerve in connection with pneumonia has been reported, which had been observed by Dr. Westhoff. He explained the occurrence of such a paresis as due to the toxins circulating in the blood. He further mentioned, that he could find in literature but one statement, by Oppenheimer, showing that similar conditions had been previously observed. Perhaps, this is due more to the fact, that such cases rarely come under the observation of the ophthalmologists, than to their scarcity.

It so happened, that I met with an observation recently which seems to be of the same nature.

On November 20, 1894, I was consulted by Mrs. H. McD., aged 36, on account of diplopia and dizziness. I found a pronounced paresis of the levator palpebræ superioris, the internal rectus, sphincter pupillæ and of the ciliary muscle of the right eye. The diplopia was overcome by a prism of 34° and

with + 10 Sn. 1 could be read. No cause being elicited for this condition, I put it down as a case of "rheumatic paresis" of the oculo-motor nerve. When I had seen the patient three times, she disappeared from my office. In the latter part of January, 1895, she returned with the statement that she had been stricken with a severe attack of acute pneumonia on the day I last saw her, and that she had recovered quite slowly. During the recovery the paresis had perfectly disappeared and the condition of her eyes was now normal.

When I reported this case at a meeting of the Association of German Physicians of St. Louis, Dr. G. Baumgarten related a case of pneumonia in a boy which was accompanied by convergent squint. In this case the paresis had also disappeared with the recovery from the pneumonia.

The similarity between these cases and the post-diphtheritic paresis of ocular muscles has been pointed out by Westhoff. He might have included the paresis after sore throat without any clinical evidence of diphtheria, of which I have seen quite a number in the course of years.

Perhaps, we will in this way be able soon to expunge from our nosology the terms of "rheumatic paresis, or paralysis" and replace them by "paresis due to such and such a toxine." In cases like the one reported, a meningitis due to the pneumococcus may be, also, thought of, as a possible cause.

SOCIETY PROCEEDINGS.

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

Thursday, March 14, 1895. D. ARGYLL ROBERTSON, M.D., F.R.S.E., President, in the chair.

* *

CASE OF DOUBLE OPTIC ATROPHY, WITH PECULIAR VISUAL FIELDS.

DR. GEORGE OGILVIE read notes of this case. The patient was a man, aged 57, who was a sorter of cigars, and a moderate smoker. His vision failed in December, 1893. He had previously had epileptic fits, and came of a family with a very neurotic history. The movements of the eyes were normal, the pupils acted sluggishly to light. In October, 1894, V. R., =⁶/_{xviii}; L. fingers at ten feet, with eccentric fixation. Mixed astigmatism in both eyes. He had floating opacities in the vitreous. Both optic discs were pale, the retinal veins were tortuous; there was a congenital crescent in both eyes. R. visual field was contracted for white and colors; a sector down and in was absent. L. visual field: contraction of the field, and complete inferior hemianopia. There was neither sugar nor albumin in the urine; no history of syphilis or alcohol. The knee-jerks were exaggerated, and a moderate degree of ankle clonus was present. The character of the visual fields pointed to a change in the optic nerve itself; it was doubtful if it were a primary atrophy or the result of a neuritis. From an old Moorfields letter in his possession, it was found that he had attended there while suffering from optic neuritis. In February,

1895, the upper and inner quadrant of his R. visual field was missing, giving an appearance of R. lateral hemianopia.

DR. JAMES TAYLOR thought it not necessary to go further than the nerve to explain the ocular symptoms in this case. It was not a case of destructive lesion in the occipital lobe; there was a history of past optic neuritis, and this was the explanation of the changes.

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A CASE OF FILARIA LOA.

Further notes of this case, which he had brought before the Society in October last, were read by the President. After removal of the parasite the patient was not troubled further for six weeks; on February 6 a worm was felt again, but was sought for in vain. Two days later a swelling appeared in the right temporal region. On February 13 the worm was felt beneath the right upper eyelid; it wriggled across and then remained coiled up there. An incision was made, and, after some dissection, a fine filamentous body, smaller than the ordinary filaria, was found; this was identified later as part of the expressed oviduct; a well-formed filaria was found deeper in the tissues, with its oviduct protruding. The blood had been examined many times in the last six months, but no traces of the filaria or its embryos could be found. The patient had occasional swellings of the skin of the arm, such as occur often among residents in Old Calabar. As to the origin of the worms in this case, although the patient had been careful about her drinking water, she had, for ten days before leaving Old Calabar, been too ill to purify the water, and may have become infected by impure water during this time.

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CASE OF TRAUMATIC CATARACT WITH A FOREIGN BODY EMBEDDED IN THE LENS.

MR. W. SPENCER WATSON read this paper. A plumber, aged 29, had injured his right eye several times, but was not

aware that a foreign body had entered his eye. The foreign body was seen, however, in the cataractous lens, which was dealt with first by discission, and subsequently by linear extraction, the foreign body being removed at the second of these operations. Everything went very smoothly, and when the patient was seen about a year afterwards there was a normal-looking pupil, and vision remained good. Mr. Watson pointed out that the time for extraction when a foreign body was present required very careful regulation, the gradual softening of the lens being watched until, it became of a semi-solid consistence, and the operation performed before it had become fluid.

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A FORM OF IRITIS NOT USUALLY RECOGNIZED.

DR BRAILEY read this paper. After a summary of several cases, he arrived at the following conclusions: That a late iritis sometimes follows an acquired syphilis, and that the average time of its attack is about thirteen years from the primary sore. That such iritis is generally double-sided, and its usual form an iritis serosa, that is to say, an iritis or rather an irido-cyclitis with comparatively little tendency to the formation of posterior synechiæ, and accompanied by dots on the posterior corneal surfaces and also by a tendency to secondary glaucoma. That the patient may show other late manifestations of syphilis, as in the cases shown, of which one has ozæna and the other choroiditis disseminata. That a similar late iritis may follow an inherited syphilis, and that the average age of the subject of it, though varying within wide limits, approximates to twenty-one. That in inherited, as in acquired syphilis, the usual form is a double serous iritis. The iritis may, however, be of a much severer type, with varying tension and with the occlusion of the pupillary area with a layer of lymph, such lymph being generally comparatively free from the iris at the pupillary edge. That such an iritis may also be accompanied by larger and more cloudy dots on the posterior

surface of or perhaps deep in the cornea, such deposits with the others resulting in the formation of a dense non-vascularizing triangular plaque deep in or behind the cornea, and usually at its lower part. That the iritis may more rarely be of a different type, either the gummatous with occasionally peripheral anterior synechiæ, or the adhesive leading even to occlusion of the pupil and consequent secondary glaucoma. That apart from the iritis, which simply attends and is quite secondary in degree to severe interstitial keratitis, the late serous iritis of inherited syphilis may show a close relation to interstitial keratitis. Thus a slight interstitial keratitis may be followed after a distinct interval by a gummatous iritis, while the iritis with blocked pupil, deep triangular corneal plaque, and varying tension may be accompanied by fine filmy or denser and wider-spread opacities in other parts of the cornea. Notched teeth are rare or perhaps even uniformly wanting in the pure iritis serosa of late inherited syphilis, while they are present in increasing frequency as the disease approximates in its associated characters to interstitial keratitis. It is very noticeable that the subjects of the late serous iritis of inherited syphilis are often of extremely good physical development.

MR. HIGGINS thought that one of Dr. Brailey's cases looked like an old case of interstitial keratitis, and he asked if such an intercurrent attack could have occurred.

MR. SPENCER WATSON said he would be glad if Dr. Brailey would emphasize the points of novelty in these cases; he had been familiar with them for some time, and thought they were generally recognized.

MR. JESSOP said that one of the cases showed punctate dots on the front of the iris, similar to those he had shown recently at the Society.

MR. LANG said there were ring synechiæ between the periphery of the iris and the cornea, or sometimes isolated peripheral anterior synechiæ in these cases.

DR. HERN asked if the iritis was primary, or an extension from keratitis.

DR. BRAILEY said in these cases the iritis was independent

of keratitis. As to the case of which Mr. Higgins spoke, the boy had been continuously under observation, and the white plaque had developed from a keratitis punctata, and not from an interstitial keratitis.

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CARD SPECIMENS.

DR. SYDNEY STEPHENSON—An Improved Test Type.

DR. BRONNER—Wire Eye Shields, for Use after Cataract Operations.

MESSRS. HARTRIDGE AND GRIFFITH—Cholesterine in Sub-Retinal Fluid of a Detached Retina, in the Eye of a Child Removed for Buphthalmos.

MR. HARTRIDGE—Cholesterine in the Anterior Chamber.

MR. C. DEVEREUX MARSHALL—Microscopical Sections of (1) An Unusual Syphilitic Growth, and (2) Tuberculous Growth.

MR. JESSOP—Primary Sore on Upper and Lower Lid.

MR. VERNON—Case of Pulsating Tumor of Orbit.—*Ophth. Review.*

SELECTIONS.

TWO SUCCESSFUL CATARACT OPERATIONS ON A DOG.¹

BY ROBERT L. RANDOLPH, M.D.

It is generally known that cataract is not uncommon in the lower animals and especially in the dog and horse. In the horse cataract is apt to be the result of recurrent irido-choroiditis, and this latter affection as seen in the horse is remarkable for its tendency to relapses, appearing often periodically and representing the disease known as "moon-blindness." Cataract, then, in the horse is almost always inflammatory in its origin.

When cataract is found in the dog there is no such history of a coincident inflammation, but we find a condition that differs little from the same affection in man. With regard to the operation for cataract in the dog no special difficulties are presented as contrasted with the same operation in man, except that we are compelled to use a general anæsthetic in the former case, and this is a disadvantage. Cocaine has undoubtedly lessened the gravity of cataract operations.

It is evident that the healing process in animals is surrounded with far greater dangers than is the case with human beings, and it is this no doubt that deters us from operating for cataract in the lower animals.

Early last October A. W. Clement, V.S., of this city, brought to my office a handsome pointer dog. The dog was

¹Read before the Johns Hopkins Medical Society.

perfectly blind and had been sent to Dr. Clement for relief. He was eighteen months old and in fine physical condition generally. His master said that he had been going blind for three months, and at the end of that time only light perception was left. On the street he would crouch at his master's feet at the sound of an approaching vehicle and could not be dragged away till the vehicle had passed. When brought to my office and allowed to smell around the room he ran into the wall and chairs at almost every turn. In being led one had to pull him along, as he was fearful of running into objects. On examination I found both eyes free from irritation. The pupils quickly responded to light. With the ophthalmoscope it could readily be seen that the lenses were opaque, and on using a mydriatic I found that they were uniformly and entirely opaque. The color presented by the cataract was more a milk-white than gray, not unlike what we see in the ordinary traumatic cataract when there has been extensive laceration of the anterior capsule and the whole lens has become immediately opaque. A similar appearance is presented by the so-called naphthalin cataract that I have produced in rabbits by feeding them on naphthalin in the manner described by Dor, Panas and others. Such cataracts belong to the variety known as soft cataract. I determined to perform discission, so that the dog was first given a hypodermatic injection of morphia and then chloroformed. My instruments were boiled a half-hour before using them. Only two instruments are necessary, the needle and fixation forceps. The lids were held open by an assistant. At this time I operated on the right eye, and I may add that the pupil of the eye had been well dilated with atropia before the operation. The needle was passed into the cornea in the usual way and a crucial incision was made in the anterior capsule. Atropia was instilled and the dog was put into a small kennel and allowed to recover from the effects of the chloroform. The next day there was a large mass of cortical substance protruding into the anterior chamber. The recovery was absolutely uneventful and at no time were there symptoms of irritation. At the end of

the first week Dr. Clement observed that the dog went about the stable-yard with greater freedom. He was confined to his kennel for two weeks and whenever let out into the yard he was closely watched by the stable-man. In three weeks there was a perfectly clear pupil, and only within the extreme ciliary margin of the pupil were there any remains of the capsule to be seen. During this time atropia was dropped in the eye three times a day. At the end of three weeks I made the following test: I arranged several chairs in such a manner as to form a zig-zag path leading from one room through a narrow door into the adjoining room, and then went into the adjoining room and called to the dog. He came along the path laid out for him without a pause. This he did several times without striking a chair. I then placed a chair in the doorway and called to him and he jumped over the chair to me without the slight hesitation. That day I operated on the other eye and used cocaine. The dog was exceedingly restless and had to be held down. This restlessness was not due to pain but to nervousness, but it was enough to convince me that a general anæsthetic is indispensable. The operation was similar to the first one, and in five weeks there was to be seen only a small band of capsule lying in the pupillary area.

At this time it was impossible to detect anything wrong with the dog's vision. He moved about with freedom and rapidity, and ten days later his master, Mr. W. T. Wilson, of this city, wrote me that he had taken the dog out on a hunt and had found him just as efficient as ever in so far as his hunting qualities were concerned, and that he jumped fences and ditches as readily as the other dogs in the field.

It seems then that the effect of the operation was to give the dog a vision that is practically perfect. At this time both Dr. Clement and I thought the case a unique one, and as far as I can learn it is quite unique in this country, but since then I have found quite a number of operations of a similar character reported in foreign journals. Among others, White Cooper,² in 1850 gives an interesting account of some successful operations for cataract performed on bears in the London Zoological Gardens. Discission was the operation employed.

Brogniez³ reports a case of successful cataract operation on a horse nine years old, and Chégoin⁴ operated successfully on an ass twenty-one years old.

As a general thing cataract in the lower animals appears in the earlier years of life, and when it occurs in the horse Crisp⁵ thinks the cause is to be found in bad light and abundant exhalations of ammonia. Crisp is of the opinion that constitutional affections have little if anything to do in the causation of cataract in the lower animals, for usually the animals affected are well nourished and live for years. It will be remembered that the physical condition of my case was perfect so far as could be seen. Haltenhoff⁶ reports a case of cataract in a dog associated with diabetes, but on the other hand Professor Moeller,⁷ of the Veterinary School in Berlin, who has operated a number of times for cataract in dogs and horses, has never found diabetes present, and this has also been the experience of Professor R. Berlin.⁸ I failed to test the urine in my case, but the general history of the dog would exclude any such complication; and I may add that in those cases of cataracts in rabbits produced by feeding them on naphthalin, frequent examinations of the urine failed to show the least evidence of sugar, though some of the clinical symptoms of these cases suggested diabetes, as for instance progressive emaciation, hurried breathing, and an excessive flow of urine.

In speaking of the causes, though, of cataract, in dogs more particularly, it is well to note the fact that accommodative strain, which may be a factor in bringing about cataract in man, can here be excluded; and inasmuch as good vision was obtained in the majority of the cases reported, it is not likely that a disease of the retina or choroid had anything to do with the existence of the cataract. Another interesting fact in connection with this case is the rapidity with which the cataract developed. Within three months after the vision began to fail the dog was blind. I was struck by the shortness of the time required for the absorption of the lenses. Ordinarily, even in very young children, it takes at least two months before absorption is complete, while in those who are older, a year or more

with several discissions is the rule. In the first eye absorption was practically complete in three weeks, and in the fellow eye nearly all the lens substance had disappeared at the end of five weeks. One would be apt to think that so far as usefulness was concerned the dog would be worthless, but it will be remembered that this was not so.

I am sure that the absolute necessity of artificial help in the shape of glasses for cataract patients is much overrated. There are cases on record (quoted by White Cooper) where after the operation for cataract the patients were compelled, for the sake of experiment, to get along without glasses—in other words, to accommodate their eyes to the new refractive conditions, and after a few months they could get along quite comfortably, though of course unable to read. The vision of every animal (man included) is no doubt limited to the needs of the animal. It is not likely then that dogs are possessed of human visual acuteness, and it is evident they do not require such vision. Certainly few, if any, demands are ever made upon the accommodative apparatus of the dog's eye, so that the loss of the crystalline lens would be attended with comparatively little or no inconvenience, and the same may be said of the horse.

Possibly the good sight in these cases is to be accounted for by a reproduction of the lens fibres, and in this connection I may refer to the experiments of Cocteau and Leroy d'Etiolles.⁹ These observers found that in a certain length of time after the removal of the crystalline lens in rabbits, dogs and cats, that another lens was formed. It is a curious fact that in several of these experiments the capsule showed no cicatrice, but was perfectly clear, and contained a lens as voluminous and consistent as the lens that was extracted, and differing in no respect from the latter. Gunn¹⁰ reports a case of traumatic cataract that had occurred in a child, where, after the absorption of the cataract, later on in life new lens fibres were demonstrable. By this time a reproduction of lens fibres may have taken place in my case, but we are not justified in attributing the good vision obtained to such a process, for sight improved at

the end of the first week, and the formation of new lens fibres would not likely have begun till the absorption of the old lens was complete.

From investigation made in the London Zoological Gardens it has been found that cataract is common to nearly all of the lower animals, but it is a suggestive fact that cataract is most often seen in the two animals nearest man, the dog and horse. Neither extraction nor couching seems to be proper in operating on the lower animals. The impossibility of keeping the animal quiet, or of surrounding it with any of the usual safeguards, is an objection to extraction. While Moeller has had several successful cases of extraction, he states that his best results followed discission. As to couching, the danger of intraocular inflammation makes this operation quite as objectionable here as it is in the case of man. In my opinion discission is the only operation applicable to these cases. A general anæsthetic is indispensable. A bandage should not be applied, as it attracts the dog's attention to his eye, and it will be rubbed or torn off and injury to the eye would result. It is imperative to use a sterile knife, for we can not here nullify the effects of infection by careful after-treatment, as we sometimes do in man. A small kennel is necessary, so that no temptation is offered to the dog to move about; and finally a 1 per cent. solution of atropia should be dropped in the eye three times daily during the first three weeks. As regards the anæsthetic to be used, my preference—from considerable experience—is in favor of ether, and I have always been under the impression that it was particularly unsafe to administer chloroform to dogs. Dr. Clement tells me that he always gives chloroform and precedes the administration of it with a hypodermatic injection of morphia, and that he has never had any unfortunate results, a fact which he thinks is explained by the administration of the morphia.—*Johns Hopkins Hospital Bulletin*.

²An account of operations for cataract on bears. By White Cooper, F.R.C.S. *Medical Times*, New Series, vol. i, page 621. London, 1850.

³Extraction du cristallin chez le cheval, par A. J. Brogniez. *Annales d'Oculist.*, 1843.

⁴Opération de cataracte sur un âne, par Chégoin. *Bull. de la Soc. de Chirurg. de Paris*, 425.

⁵Specimens of cataract and of opacities of the cornea in the lower animals. Edwards Crisp, M.D. *Trans. Path. Soc.*, London, vol. xxii, 350.

⁶Klinische Mittheilungen von G. Haltenhoff. *Zeitschr. f. vergleich. Augenheilk.*, 1885, p. 65.

⁷Casuistische Mittheilungen über das Vorkommen und die operative Behandlung des grauen Staars beim Hunde, von Prof. Dr. H. Moeller. *Ibid.*, 1886, p. 138-146.

⁸Beobachtungen über Staar und Staaroperationen bei Thieren, von Prof. Dr. R. Berlin. *Ibid.*, 1887, 59-76.

⁹Experiences relatives a la reproduction du cristallin, par MM. Cocteau et Leroy d'Etiolles. *Journal de Phys. exper. et patholog.* Tom. VII., 30-44.

¹⁰*Trans. Oph. Soc. Unit. Kingdom*, London, 1888, VII., 126.

REVIEWS.

WILLS EYE HOSPITAL REPORTS, VOL. I, NO. 1. Published by the Editorial Committee of Wills Eye Hospital, Philadelphia, Pa. Price, \$1.25 per number.

Like a number of other large ophthalmic clinics, the Wills Eye Hospital staff, have begun to publish some of their work themselves in pamphlet form. This first number is certainly a very creditable one and contains much that is interesting and suggestive.

DISEASES OF THE EAR. A TEXT-BOOK FOR PRACTITIONERS AND STUDENTS OF MEDICINE. By E. B. DENCH, Ph.B., M.D. [New York: Appleton & Co. 1894.

This is an excellent text-book. It is clear and concise in its language and throughout illustrated in a manner to help the student in grasping the subject. We can heartily recommend it.

ALT.

A CASE OF ACCIDENTAL SPONGE-GRAFTING ON
THE CONJUNCTIVA OF EIGHTEEN MONTHS'
DURATION, WITH SOME SUGGESTIONS
UPON SPONGE-GRAFTING IN
EYE-SURGERY.

BY A. G. THOMSON, M.D., PHILADELPHIA.,

Demonstrator of Ophthalmology in the Philadelphia Polyclinic, and Ophthalmic
Surgeon to Bethany Dispensary and to the Dispensary to the
Children's Hospital.

The case herewith reported presents two interesting features:

I. The conditions under which the foreign material was introduced and the length of time it remained attached to the conjunctiva.

II. A beautiful illustration of the so-called process of sponge-grafting, which may suggest for it some further uses in eye-surgery.

The case that of a colored girl, sixteen years old, who came to Wills Hospital, complaining that there had been something growing in her right eye for the preceding eighteen months. On examining the eye I found a small swelling on the outer portion of the lower lid, giving the appearance of a fair-sized chalazion. As I drew down the lower lid to expose the palpebral conjunctiva a small mass protruded, yellowish in color, from which exuded a thin, purulent discharge, and resembling a papillomatous growth in appearance. Subsequent questioning showed that the girl had been an inmate of the House of Correction, having been discharged from that institution last August, after two years' confinement, and that six

months after admission she noticed one morning this growth in the eyelid. She consulted one of the female attendants, and was told to bathe the eye in hot water. After two weeks of this treatment and the growth not disappearing, the attendant resorted to surgical means and attempted to remove it with a pair of forceps. This time she was more successful, securing a portion of the sponge and with it some of the conjunctival tissue, and causing some bleeding from the lid.

As I could not account for the presence of the growth, and also as it resembled sponge in character, I directed my questions with the object in view. The girl then stated that all the girls in her department washed themselves with one large sponge several times a week, and that often after washing she had noticed small particles of sponge adhering to her skin. With this history I then examined a piece of the mass microscopically, and found it to be indeed sponge. The photograph taken did not turn out well, so I can not show the position and relation of the sponge in the conjunctival sac. On examining the lid more closely I found the sponge firmly implanted in the palpebral conjunctiva toward the outer side of the lid, yellowish in color, oval in shape, and with ragged edges; it was 8 mm. long, 7 mm. wide, and 3.5 mm. high. As for the remaining portions of the eye, they were apparently normal, with the exception of that portion of the ocular conjunctiva that came in contact with the sponge when the eyelid was closed. Here the vessels were somewhat enlarged and the conjunctiva slightly hyperemic.

It would seem improbable that a foreign material the size of the piece of sponge stated, consisting of a substance subject to very septic surroundings (*i. e.*, a sponge used in the House of Correction on all kinds of people until it became so rotten that it was falling to pieces), could remain so long in the conjunctival sac without causing the slightest discomfort and only a very little irritation; but I think, if we look into the condition more closely, the absence of symptoms can be accounted for, as the sponge, being of soft animal tissue, becoming attached to the conjunctiva, the granulations springing up

in the interstices of the sponge virtually made it a part of the lid itself, and it therefore caused no more irritation than any other small piece of granulation-tissue in the same position.

As a case of sponge-grafting, the formation of new tissue, as seen in the sketch of the section, shows it to be a perfect success.



FIG. I.—Showing Granulation-Tissue Intersected by Sponge-Fibers. $\times 300$.

This method of using sponge to replace lost tissue was first suggested by Prof. D. J. Hamilton, of Edinburgh, in 1881, who recognized the fact that in the organization of tissue the blood-clot or fibrinous lymph plays only a mechanical and passive part in any situation in which the organized tissue becomes replaced by a fibrous cicatrix. This being the case, he hit upon the idea of using sponge as a substitute, as the interstices of the sponge resembled the fibrinous network in a blood-clot or in fibrinous lymph, and at the same time being an animal tissue it would undergo tissue-digestion.

The process that occurs when a piece of sponge is placed in contact with an exposed surface and remains long enough

is that a quantity of fibrinous lymph is effused into the sponge; this lymph becomes organized, and then is replaced by granulation-tissue, which extends and fills the interstices of the sponge, with, finally, a total absorption of the sponge-skeleton itself, leaving only a mass of cicatricial tissue.

The girl refused to allow me to remove the entire sponge at that time, but agreed to the removal of a small portion. This was excised, with a small piece of the surrounding tissue, which was cut and mounted by Dr. Charles W. Burr. In hardening the section the free portion of the sponge, that part not being infiltrated by new tissue, was detached from the remainder of the graft. This accident is almost impossible of avoidance, owing to the destructive effect of the hardening fluid on the sponge. I am, therefore, unable to show all the stages from the deep granulation-tissue to the lymph in free sponge.

The section presented the following appearance: A mass of granulation-tissue in different stages of development intersected in all directions by a network of yellowish bands that represent the sponge-skeleton. The base of the new growth is composed of embryonic, more or less developed, connective tissue, which in the deeper layers has quite replaced the sponge-fibers. Above the deep part, gradually shading from it and filling the interstices of the sponge, is the new tissue, which consists of new granulation-tissue, blood-cells, leukocytes, giant-cells, etc.

The evidence of tissue-growth by aid of sponge-graft is clear, but the mode of absorption or disappearance of the sponge-skeleton is as yet unknown, although this undoubtedly occurs, as we find in the deeper layers that the sponge-skeleton is more reduced in size and the fibers are fewer in number.

It is commonly believed, although the section does not show it, that absorption is due to an eroding influence of the giant-cells analogous to the action of the osteoclasts in bone-formation, as they are found in great numbers closely adhering to sponge-fiber.

In my sections there are several places showing giant-cells in close contact with the fibers, but I can not see any evidence of absorption from this cause. I find, also, that these giant-cells are numerous in only the superficial portion, and are extremely rare in deeper portions where the absorption takes place. My own opinion is that absorption is more probably due to a softening or separation of the fiber of a laminated structure by the pressure of the densely packed surrounding granulation-tissue, and, finally, absorption by the juices of the tissues, as the disappearance of the sponge is seen in only the deeper layers and apparently affecting the whole fiber at the same time.

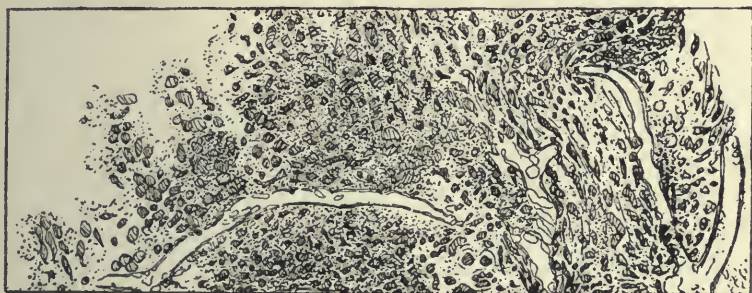


FIG. II—Showing Absorption of Sponge-Fibers. $\times 450$.

So far as I can learn, this is the first instance in which sponge has been grafted, either intentionally or accidentally, on the conjunctiva. From the undoubted evidence of formation of new tissue, from the non-irritating properties of the sponge as seen, from the means under which it was introduced and the length of time it remained in the conjunctival sac, and from the microscopic proof of its final absorption, we have every reason to believe that sponge-grafting is a valuable means of replacing tissue lost by burns or injuries to the eyelids, which are eventually followed by ectropion, entropion, symblepharon, etc., and from the disfigurement caused by shrinking cicatrices.

A CASE OF PARALYSIS OF THE SUPERIOR RECTI MUSCLES.

BY WM. E. BRUNER, M.D. (UNIV. OF PA.), CLEVELAND, O.,

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In speaking of the rarity of paralysis of the superior rectus, Duane¹ quotes Mauthner as stating in his work upon Paralysis of the Ocular Muscles, that "of 108,000 cases of eye diseases of all sorts, collected by Mooren, there is not a single case of isolated paralysis of the superior rectus recorded, while in Graefe's 40,000 cases there are nine; in Schubert's 20,000 cases, eight, and in Schöler's 20,000, three." Hulke, on the other hand, he says, had the very unusual experience of seeing five cases of isolated paralysis of the superior rectus out of nineteen cases in which the third nerve was affected. Duane's own experience accords with Hulke's; in fact, he says, "isolated paresis of the superior rectus stands next in order to that of the external rectus." He reports fifteen cases, in six of which the paralysis is limited to the superior rectus. In four of these six cases both superior recti are involved, while in seven more out of the total number both were more or less affected.

He arrives at the conclusion that the paresis is not due to a "muscular or orbital lesion of the nerve twig supplying the superior rectus," but is "the result of a weakness of the muscle itself, due to congenital malformation, or, more likely, to arrest of development."

Gowers² says that paralysis of upward movement of the eyes is often observed associated with paralysis of the levators in cases of central diseases; and that possibly there may be a

higher center, disease of which may paralyze upward movement of the eyeballs without affecting the lids. He reports one such case,³ in which the autopsy revealed a very small tumor in the middle line behind the posterior quadrigeminal bodies, damaging these slightly, and also the velum and the adjacent part of the inferior vermiform process of the cerebellum. It is possible, he says, that such a defect may be "due to disease of the hemisphere, but our knowledge of this cause is imperfect." "In the rare cases," he further adds, "in which a lesion is limited to the gray matter of the corpora quadrigemina, the chief eye symptom appears to be a loss of conjugate movements, especially of that upwards."

† Congenital ptosis is frequently (or generally) associated with such a defect, and is probably due to a congenital central defect. Uhthoff⁴ in 100 cases of multiple sclerosis, found paralysis of eye muscles in 17, in one of which the paralysis was for conjugate movement upwards. Jeffries⁵ reports five cases, with autopsies by Thomsen,⁶ Wieden,⁷ Hoppe,⁸ Henoch⁹ and Gee.¹⁰ In all these five cases a lesion was found at the level of the nuclei of third pair of nerves, and in all but Thomsen's case the disease was central. In his case the autopsy revealed a gumma at the point of exit of the third nerves, between the corpora mamillaria and the crura. On the left side only a small portion of the crus and substantia nigra was affected, while on the right the growth involved the lower portion of the red nucleus, the median third of the substantia nigra and less of the crus. The right third nerve was extensively degenerated, the left but slightly. The nuclei of the third nerve were normal. In conclusion, Jeffries says that "paralysis of up or down motions, or of both motions, indicate disease in the region of the corpora quadrigemina, but may be due to disease in the third nerves proper, or their points of exit."

At the International Ophthalmological Congress at Edinburgh, 1894, Sanvinean reported a case of paralysis of eyes for upward and downward movement and for convergence, a form which was described by Parinaud in 1883.

Verrey¹¹ reports an instance of paralysis of movement

upwards and downwards. The paralysis in this case had appeared suddenly,* and at the end of several weeks disappeared.

The following case is of interest, as it shows paralysis of the superior recti alone:

Miss S., age 28 years, gives the following interesting history: Five or six years ago she had what her physician has told me was probably an embolism of one of the cerebral arteries. Her illness, which continued for a year or longer, began with a sore throat; hepatic trouble followed, which was associated with marked jaundice, and finally the paralysis, or rather paresis, appeared. It came on suddenly and involved the right side, but she does not know whether the face was affected. The loss of power was only partial, and she was not confined to bed. Her hearing and vision were very much affected during her illness. Other history in regard to her eyes at that period is uncertain. There is a doubtful history of diplopia at times, but she does not know whether the double vision was produced by looking in any particular direction. Her vision, she says, has become poor, both for distance and for close work, and the eyes tire very readily. Use of them causes frontal headache, though she never has any pain in the head at any other time. She is practically unable to do any reading or close work. Frowns a great deal in her effort to see clearly. Her general health, which was good before that severe attack of illness, has not been the same since that time. She is still very decidedly nervous."

Examination: Vision, O. D. $\frac{5}{xv}$, O. S. $\frac{5}{xii}$. Accommodation, O. D. Jaeger, No. 1 pp, 15 cm.; O. S. Jaeger, No. 1, not; No. 4 pp, 16 cm. Muscles, at distance with Maddox rod esophor, 2° ; left hyperphoria, 2° . In convergence either eye wanders out slightly under cover, or measured with a vertical prism before one eye, exophoria is 6° . The movements of the eyes are perfectly normal in all directions except upward, in which direction they can move scarcely at all, not more than 5 degrees. With a red glass before one eye, it was not possible to produce diplopia in any part of the field. When she

attempts to look up, the eyes manifest a slight unsteadiness, amounting almost to a nystagmus. This oscillatory movement is slightly rotary in character, as if the oblique muscles were attempting to help the recti elevate the globes. There is no paresis of either levator palpebræ. She knew nothing of this peculiar condition until her attention was directed to it, and she does not know how long it has existed. In fact, she seems always to have had some difficulty in this respect, and she certainly has not noticed any difference since her illness.

The ophthalmometer indicates in O. D. $1\frac{1}{4}$ D. axis 105; in O. S. 1, D. axis 90.

Ophthalmoscopic examination: In O. D. the media are clear, disc is round, rather irregular in outline, with its edges somewhat hazy, a crescent of choroidal pigment outward, and patches of similar pigment at several points. The blood-vessels, both arteries and veins, are of full size and normal color, but the disc appears slightly pale. Several splotches of fine retinal changes, the remains of a former retinitis, are scattered throughout the fundus; one patch is almost at the macula. In O. S. the condition is very similar. The splotches faint as in O. D., are more numerous, and several occupy the perimacular region. Under atropine the refraction was carefully measured, with the following result:

O. D. spher. + .75 \bigcirc cyl. + .87 axis 105 v. $\frac{5}{VI}$.

O. S. spher. + 1. \bigcirc cyl. + 50 axis 90. v. $\frac{5}{VII}$.

The fields for form and the different colors are perfectly normal.

Urine analysis showed an abundance of amorphous urates, but neither albumen nor sugar. K. J. and station are normal. There is no specific history

She was given the above correction (less .50 D) for constant use. At once her eyes began to feel more comfortable, and at her last visit, more than two months after she put on her glasses, she said she is feeling very much better in every

respect; is stronger and less nervous; has no more headaches, and can use her eyes as much as she wishes. The condition of the muscles, however, is unchanged.

In all of Dr. Duane's cases there was slight exophoria, as we should naturally expect, but in this patient we find instead two degrees of esophoria. This remains unchanged after she has worn her glasses for two months. Then, too, it is impossible to develop diplopia in any part of her field. The relative strength of the two paretic muscles has, in other cases, often been found to vary from time to time, but in this patient it has remained unchanged, nor is there anything here to indicate spasm of the inferior oblique, as has sometimes been noticed.

As to the cause of the paralysis in this patient, the history of her illness, with the occurrence of a cerebral embolism, would suggest the possibility of an involvement of the nucleus in the floor of the fourth ventricle at the same time, and yet this scarcely seems possible without the patient observing some change in the motility of the eyes.

I am inclined to think that this case is similar in type to those reported by Duane, in that the paralysis is congenital in origin, but I incline to the belief that it is due to central deficiency rather than to malformation or arrest of development of the muscles.

¹Archiv. of Ophth., Vol. xxiii, Nos. 1 and 2, p. 61.

²Diseases of the Nervous System, Vol. ii, p. 185.

³Trans. Ophth. Soc. I, '81, p. 117.

⁴Archiv. of Psych., xxi, 55, 377.

⁵Boston Med. and Surg. Jour., Oct. 20 and 27, 1892.

⁶Archiv. of Psych., xviii, 616.

⁷Centralblatt f. Augenheilk., iv, 209.

⁸Neurolog Centralblatt, 1888, p. 628.

⁹Berliner klin. Wochenschr., 1874, p. 125.

¹⁰St. Barthol. Hospital Report, xxvi, p. 106.

¹¹Revue Medicale de la Suisse romande, March 20, 1893.

SKIN GRAFTING FOR EPITHELIOMA OF THE EYELID.

Dr. Risley exhibited a case of epithelioma of the lower eyelid, in a laborer, aged 50 years. The diseased tissue skirted the edge of the lid near its center for 12 millimeters, and had a vertical diameter of 1 centimeter. It presented the characteristic ulcerated center, inclosed by indurated borders. The tarsal cartilage was involved at only a small point at the margin of the lid, and there was no enlargement of the lymphatics. The epithelioma was inclosed and firmly clamped in the fenestrum of the Desmarres forceps, which excluded the blood-supply. Every vestige of the disease was then removed by scraping with a small scalpel. This done, the forearm, which had been carefully sterilized, was bared and a thin layer of epithelium shaved off with a razor and deftly spread upon the area left by the epithelioma, the thin edges of the graft extending over the edges of the healthy skin.

He urged the importance of attention to every detail in this apparently simple procedure. Aseptic rather than antiseptic precaution should be observed, since any strong antiseptic was liable to injure the surface-cells in the newly-bared area, and also in the delicate graft, and success depended upon the unimpaired health of both. He, therefore, secured asepsis by flooding the field of operation with the physiologic salt-solution. It required very delicate manipulation to secure a graft of sufficient thinness, without allowing it to roll up on the razor. A very thin and sharp, hollow-ground blade was better than one with a flat surface. It should be warm and constantly bathed with the warm salt-solution. The clamp should be removed, and all bleeding checked before applying the graft, since otherwise it would be either washed away by the bleed-

ing or lifted by blood-clots from the necessary contact with the vital cells of the part. The very thin graft required great lightness of touch, in order to spread it smoothly over the part. An excellent plan was to bring the side, next to the edge of the blade, into contact with the healthy skin at one side of the wound, to which it would cling with sufficient tenacity to permit the gentle withdrawal of the instrument, thus permitting it to fall without folds upon the surface to be covered by it. The *cul-de-sac* of the conjunctiva and the surrounding tissue were lightly dusted with iodoform, but none on the graft. A square of aseptic gauze was then spread over the closed eyelids, and this dusted with iodoform, and the whole covered with a liberal pad of absorbing cotton held firmly in place by a roller bandage. This dressing would not be disturbed for two days. The operation completed, he exhibited a patient, upon whom the same had been done, three years before, with complete success. Although the graft had been much larger, there had been no noticeable contraction, and no deformity. In cases where the tarsal cartilage is not too deeply involved, he regarded this procedure with much more favor than the removal of a triangular section of the eyelid containing the diseased tissue, which necessarily shortened the lid, caused deformity and often constant epiphora by dragging the lachrymal punctum out of its normal relation to the eyeball.—*Philadelphia Polyclinic.*

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ORIGINAL ARTICLES.

TRANSPLANTATION OF SKIN IN PLASTIC OPERATIONS ON THE EYELID.¹

BY WALTER B. JOHNSON, M.D., PATERSON, N. J.

The transplantation of skin flaps in plastic operations upon the eye-lid, by the method in vogue at present, is the result of a gradual development in the size of the portions of new tissue to be transplanted. The method of supplying new dermal tissues where loss of skin had resulted from accidents, burns or other causes, was originally introduced by Professor J. L. Reverdin, of Geneva, Switzerland, in the year 1869. It was called "skin grafting" and consisted in the application to granulating surfaces of very small portions of epidermis snipped from the skin of a living subject, care being taken that the dermis should not be included in the graft. The grafts were applied to the diseased surfaces and resulted in the formation of new cicatricial tissue, which was undoubtedly the product

¹Read at the Forty-Sixth Annual Meeting of the American Medical Association, May, 1895. Section on Ophthalmology.

of the proliferation of the transplanted elements. Thiersch, Pollock, Bryant and others adopted the method, increasing the size of the grafts and including the cutis as well as the cuticle, believing that the proliferation occurred from the dermis as well as the epidermis. Fiddes reported cases in the *Lancet* of new tissue formation resulting from the proliferation of epidermal scales scraped from the skin by a long bistoury. The method rapidly came into general use; it is, however, only skin grafting, the implantation of a nucleus for the formation of cicatricial tissue and not transplantation of true skin.

The implantation upon granulating or fresh cut surfaces of large skin flaps from adjoining parts was introduced by Tagliacozzi many years before the possibility of skin grafting was thought of. He carefully dissected a portion of skin from a point near the surface to be covered, retaining at its base a pedicle through which the flap was to receive its nutrition. Modifications applicable to various locations were suggested by different operators. The procedures recommended for the plastic surgery about the eye-lids were not wholly satisfactory in consequence of the unsightly cicatrices at the point of removal of the flap, the thickening about the pedicle and the frequency of ulcerative processes intervening which resulted in still more serious deformity than existed prior to the operation.

In 1878, Mr. J. R. Wolfe, of Edinburgh, reported in the *London Medical Times and Gazette*, of June 3, a new method of "the transplantation of skin flaps from distant parts without pedicle." Following this, operations were successfully performed and reported by Wadsworth, Noyes, Aub, Mathewson, and others. The many advantages of the procedure led to its immediate adoption by ophthalmic surgeons. The object of the operation is the transplantation of healthy skin flaps to the required situation, the agglutination and healing by first intention, the permanent adhesion of the healthy new tissue at the point of implantation, and the relief of the existing deformity.

The skin selected for transplantation must, as nearly as may be, approximate the conditions and quality of the skin at

the location to which it is to be transplanted; an allowance of fully one-third must be made for shrinkage of the flap, all areolar tissue must be carefully removed, the flap must be dipped in tepid water and then thoroughly dried, the site of operation must be carefully prepared, and if the transplantation is to be made on the day of operation, all small blood clots and other detritus must be removed. In some cases it is desirable, especially if arteries have been tied, to allow an interval of two or three days to elapse between the time of the preparation of the wound and the application of the flap as sepsis may affect the flap if sloughing of any of the tissues occur. Before transplantation the granulating surface must be very carefully washed and dried; the prepared flap is then applied and gently pressed into position where it will adhere like sticking plaster. The wound is then dressed; no sutures are recommended although in many of the cases reported, catgut or other sutures have been used; sheet lint compress and bandage is applied and allowed to remain *in situ* for four days. Great care should be used in removing the dressing lest the flap be torn from its new adhesion by dragging. Goldbeater skin plaster is often used next to the flap.

The following case was operated successfully by the Wolfe method:

H. T., aged 3; colored. Applied at the Paterson Eye and Ear Infirmary for treatment, stating that six months ago he had received an injury of the right eye-brow from falling upon a stone step. The injury was followed by excessive swelling and subsequent inflammation. The family physician made an incision and a large quantity of pus was evacuated. The wound closed on two occasions and re-incision was necessary. Extensive destruction of the skin of the upper eye-lid resulted from ulceration which occurred during the stages of acute inflammation and was never at any time entirely healed. The contraction of the cicatricial tissue thus formed produced complete eversion of the upper eye-lid as shown in Plate No. 1.

August 2. Upon admission the child was in apparently good physical condition. There was eczema about the face

resulting from the excoriation of the ichorous discharges from the eye. The ectropion of the right upper eye-lid was so extensive that only about 3 lines separated the ciliary margin of the lid and the eye-brow. The everted palpebral conjunctiva was swollen, thickened and rough, bleeding upon the slightest touch. Almost all of the retrotarsal fold was exposed and it nearly concealed the eye-ball; there was a deep central ulcer of the cornea and a constant discharge of thick muco pus.



PLATE NO. I.

The patient was ætherized and an incision made exposing the frontal bone which was diseased. The carious bone was removed and the wound dressed. After the opening closed the ulceration healed, the swelling of the lid decreased under proper diet and palliative medication. The cicatricial contraction resulted in an increased eversion of the lid.

September 25. The patient was again ætherized, and incision was made midway between the brow and the edge of the lid $1\frac{5}{8}$ " in length; the lid was carefully dissected, the at-

tachment of the cicatricial bands divided and the edge of the upper lid stitched to the lower. The result of this procedure was a large gaping wound $1\frac{5}{8}$ " in length and $\frac{7}{8}$ " in width in the median line. An elliptical incision was made on the inner side of the left thigh $2\frac{5}{8}$ " in length and $1\frac{2}{8}$ " in width at the largest diameter of the ellipse. The skin within the lines of the incision was carefully dissected from the leg and all areolar tissue removed. After preparation the flap measured nearly two inches in length and about one inch in width in its widest part. The flap and the wound were rendered aseptic; four fine catgut sutures were used to unite it to the edges of the wound, gold beater skin plaster was then placed over the new lid and the eye dressed with a compress bandage.

September 29. The dressings were removed, care being taken to prevent dragging upon the flap, the stitch uniting the eye-lids and the stitches from the end and center of the flap were carefully cut and drawn out. The transplanted skin flap seemed to have united in its new location although it presented a grayish appearance externally which looked like semi-transparent glass. The pigment deposit in the deeper layers was so dark that it appeared as if sloughing of the entire flap was imminent. There was no purulent discharge. The eye was dressed with plaster and bandaged as before.

October 2. The dressings were again removed and a thin gray membrane nearly the size of the flap came away with the plaster. This was at first believed to be the flap itself. On closer inspection, however, the entire surface of the new lid presented a peculiar appearance of semi-granulation points of reddish color. The excessive pigment deposit having materially lessened, a glazing which seemed to be the result of a deposit of thick viscid mucus indicated the formation of a new layer of epidermis. The dressings were re-applied.

October 4. The eye-lid when exposed disclosed the presence of a grayish membrane with commencing pigment spots which covered the entire field of the operation.

October 6. The membrane has assumed the appearance of newly-formed skin, the lid maintains its natural position;

there has been very little purulent discharge during the recovery. After this date the skin became more natural in appear-



PLATE NO. 2.

ance, softness and pliability. No unfavorable symptoms occurred. There was complete relief of the deformity. The eye-lid could, not, however, be elevated to the extent of that of the fellow eye. The accompanying plate No. 2 illustrates the condition six weeks after the treatment was discontinued.

REPORT OF A CASE OF MIND-BLINDNESS WITH AUTO-WORD-BLINDNESS.¹

BY L. R. CULBERTSON, M.D., ZANESVILLE, OHIO.

Mr. P. C., aged 67 years, first came under the writer's observation two years ago, when he had an attack in which, while talking to his wife, a friend came in. He looked at him in a dazed manner but did not recognize him. His wife said, "that is Mr. H." He replied, "I know no Mr. H., I do not know him." The friend then said, "I am Mr. H., do you not know me?" He thought for some little time and then said "yes." The attack lasted nearly half an hour, at the end of which time he could recognize everybody. He had another attack a year later. Eighteen months after the first attack he had an attack of nervous prostration with excessive and constant flow of saliva—a symptom of cerebral softening—and a weak and fatty heart. He was kept alive five months by strychnine and atropine prescribed by Dr. C. M. Rambo, of this city. A month before his death acute meningitis or cerebritis developed, with insanity. The mind-blindness was then manifest in a modified form. He could recognize all his friends, but he was affected by a peculiar form of alexia or word-blindness, *i. e.*, he would write a sentence and in it there would be several words totally foreign to the subject of which he wrote. The words were usually spelled correctly and he could see them and read them with great difficulty, but he was not aware that he had used the wrong words. He could read letters of others and print and understand the sense perfectly, whether he read aloud or to himself. (He was fairly well educated and had been

¹Read before the Muskingum County Medical Society.

a school teacher). "In ordinary alexia, according to Swanzy,² there is a loss of power of understanding printed or written speech-symbols and is held to be nothing more than a partial mind-blindness."

I have not been able to find a case on record, in which the patient could read printing and writing of others correctly and was not able to note the errors in his own writing.

A month before death hallucinations of hearing developed. As the case progressed symptoms of cerebral compression gradually developed, but there was no paralysis, except towards the last when there was the paralysis of general cerebral compression. A month before death I examined his eyes. The pupils reacted normally to light and accommodation. Ophthalmoscopic examination: R. E., shows optic neuritis and marked atrophic cupping of disc; veins greatly engorged and arteries much diminished in calibre; disc quite pale. L. E., neuritis less marked than in right eye, disc pale; veins enlarged. Visual field one-third concentrically restricted in both eyes. I did not test the color vision or color field. No scotomata or blind-spots. No hemianopsia. No ptosis or strabismus. No Charcot's disease or paralysis agitans, or locomotor ataxia. Knee-jerks normal. No post-mortem was made.

REMARKS.

Mind-blindness is often associated with color blindness, or with hemianopsia. One extremely interesting and novel feature of this case was his being able to see, read and understand the writing of others, but not being able to detect errors in his own writing. This would indicate that there must be not only a center for the visual memory of words written or printed by others separate and distinct from a visual center for words written by one's self. The reason for his writing the wrong words was that the cortical cells which should have sent out the impulse for the proper words were destroyed. These cells

²British Medical Journal, 1888.

are located in that portion of the brain which presides over reason known as conscious cerebration. The unconscious portion of the brain has its various centers connected by nerve fibres with the conscious or reasoning portion and refers all its ideas to the reason for decision before acting. Now, if the centers for these words in the reason are destroyed, then the unconscious portion can not get the aid of reason and will therefore suggest the wrong word.

Whether the lesion was the result of a small hemorrhage or embolism or simply of softening of a small spot of cortex, we can not tell, and could not tell unless the patient had died suddenly before acute symptoms set in.

The patient was right-handed. During the attacks, when the friend would speak to him, he would remember him for a few moments and then forget him, just as happened in cases which have been reported.³ During these attacks he had great pain in his head and confusion of ideas and felt a great weakness.

On a number of occasions he was affected with the loss of visual memory for places so that he could not find his way home and had to be led home. On one occasion he saw a man on the street and he said there were three men, when in fact there was but one. This was due to hallucination of sight.

Another interesting symptom was that he could write figures but could not calculate sums. Also, on several occasions, in trying to read his own letters he could not succeed at all and had to have them read to him, but even then he could not see his grammatical errors.

The patient had only three attacks of the loss of visual memory for faces, the first several years ago and they always came on with symptoms of heart-failure so that it led me to suppose that there was softening beginning in the visual memory center, and the marked anæmia of this center caused by imperfect heart action made it suffer more than the other cortical centers.

³London Lancet, 1869, Vol. I, p. 363.

One remarkable feature of this case was the absence of scotomata, hemianopsia and hemiachromatopsia. Referring to the literature on the subject, Swanzy⁴ reports a case in which there was mind-blindness with hemiachromatopsia and in which patient could not recognize his own wife until she spoke. In a case reported by Wernicke⁵ the remarkable circumstance was noted that with good acuteness of vision, and without any absolute defect in the field, there were disseminated over a greater portion of the field, a number of relative scotomata or blind-spots, within the area of any one of which, although objects could be seen by the patient, yet he could not tell what they were. Color vision was not tested.

The position of the cortical center for visual memory is still a subject for discussion. Nothnagel, Wernicke and some other writers assign this function to all, or to most, of that part of the occipital cortex which does not form the center of vision. Gowers thinks that it is either in the anterior part of the occipital lobes or in the posterior part of the parietal lobes. Swanzy⁶ says, "Judging by three cases of mind-blindness associated with hemianopsia, I think that the center for visual memory lies near the visual center, probably in the occipito-temporal lobe." Macewen⁷ reports a case due to pressure from skull on which he operated and found that the symptoms were caused by pressure on the angular gyrus and supra-marginal convolution. Operation relieved these symptoms.

In alexia or word-blindness, Gowers, Wernicke, Wilbrand, Ferrier and Broadbent localize the lesion in the angular gyrus of the left hemisphere. Nothnagel,⁸ while he localizes the center for visual speech-symbols in this same region, dissents from the view that word-blindness is to be included in mind-blindness; and the fact that in some well-marked cases of

⁴Transactions of the Ophthalmological Society of the United Kingdom, 1888.

⁵Loc. cit., Bd. III, p. 552.

⁶Trans. Oph. Society United Kingdom, 1888.

⁷Jour. Brit. Med. Association, 1888.

⁸Verhandlungen des VI Congress f. Innere Medicin zu Wiesbaden, 1887.

mind-blindness might seem to support this view.⁹ But, if the center for visual memory of every kind, except that for printed or written speech-symbols, is situated in the occipital lobe as Nothnagel himself holds, there is no reason why word-blindness should accompany mind-blindness, unless in those cases in which the lesion extends to the angular gyrus.¹⁰

A good many cases of alexia with right hemianopsia have been recorded, and a natural explanation of this combination of symptoms is supplied by the proximity of the center for vision to the angular gyrus.

Dr. Borel¹¹ reports a case in which, in a right-handed person, word-blindness along with mind-blindness accompanied left hemianopsia; and Landolt¹² has placed on record a case of right hemiachromatopsia in which there was word-blindness.

A peculiar variety of alexia is reported by Brandenburg.¹³ The patient who was affected with right homonymous hemianopsia, was unable to read any printed or written letters or words, yet he could read off with ease long numbers reaching to tens of thousands in Arabic characters.

The remarkable symptom termed dyslexia was first described by Berlin.¹⁴ The patient is unable to read more than a very few words consecutively, either aloud or to himself, owing to a feeling of dislike or disgust which suddenly invades him, and which he cannot overcome. In every instance the lesion was on the left side of the brain, the patients being all right-handed. The disease seems to have occupied chiefly the inferior parietal lobule, extending sometimes as far forward as the inferior frontal convolutions, and sometimes as far backward as the angular gyrus.

In conclusion, I will state that as I can not find any similar case on record I will call this a case of auto-alexia, *i. e.*, unable to read understandingly the words written by self.

⁹Swanzy, in Brit. Med. Jour., 1888.

¹⁰Ibid.

¹¹Landolt, loc. cit.

¹²Loc. cit.

¹³Loc. cit.

¹⁴Arch. f. Psych., Bd. XV, p. 276.

CONGENITAL RHABDO MYOMA OF THE ORBIT.

BY J. ELLIS JENNINGS, M.D., ST. LOUIS, MO.

On April 15, 1895, Mrs. H, a farmer's wife living about twenty miles from St. Louis, consulted Dr. S. Pollak about a swelling which existed just below the right eye of her fourteen-months-old boy. Dr. Pollak sent her to the eye clinic of the Mullanphy Hospital where we both made a careful examination of the case.

According to the mother's statement, she first noticed the small lump about six weeks previous and that it seemed to be getting larger.

The swelling or tumor was situated just below the right eye on a level with the orbital margin and to the nasal side of the median line. On first glancing at the child the swelling suggested a greatly distended lachrymal sac, but its position was below and to the right of the puncta and there was no indication of inflammation. The tumor was firm to the touch, could be moved over the edge of the orbital margin and appeared to extend backward into the orbit. The eyeball was displaced, to a considerable extent, outward, upward and forward. It was thought advisable to remove the growth at once and the operation was done April 18. The growth was loosely attached to the surrounding tissue and no difficulty was experienced in dissecting it out except at its inner extremity, where it was firmly attached in the region of the ethmoid bone. When removed, the tumor measured one inch in length and one-fourth of an inch in breadth. It was hardened in formol solution and sections stained with hæmatoxylin and methyl-blue. The microscopical structure of the tumor is as follows:

In a matrix of connective tissue are seen interlacing bundles of striated muscular fibres which are so abundant that they form the most striking and important tissue of the tumor. The muscular fibres are about one-third the thickness of skeleton muscular fibres and closely resemble those of a rhabdo-myoma of the kidney of a new-born child pictured in Fig. 45 of Formad's plates illustrating the histology of tumors (Lippincott & Co., 1883). The only difference is that in our case the muscular fibres have an increased numbers of nuclei and the connective tissue is filled with free nuclei and round cells. The connective tissue cells and the nuclei of the muscular fibres are deeply colored by the stain but the muscular fibres themselves remain unstained. A few blood vessels are observed which have enormously hypertrophied walls. Although foetal tissue is very rich in nuclei, yet from the large quantity of round cells and free nuclei found in the connective tissue, the statement of the mother that the tumor was growing is undoubtedly correct. The only similar tumor mentioned in literature seems to be a leio-myoma described by Dr. Alt in his book on the Histology of the Eye, and I therefore think it of sufficient importance to place on record.

REVIEWS.

SKIASCOPY AND ITS PRACTICAL APPLICATION TO THE STUDY OF REFRACTION. By EDWARD JACKSON, A.M., M.D. 112 pages, with 26 illustrations. Philadelphia: Edwards & Docker Co. 1895. Price, \$1.00.

An excellent exposé of the underlying optical principles and their practical application of skiascopy, in determining the refraction, written by a gentleman who has devoted especial time and study to this subject and has been one of its foremost advocates, this book must be very welcome to every student of ophthalmology. It is, besides, excellently printed and is singularly free from typographical errors, of which, in reading the book through, we have come only across a single one in the first paragraph.

LA PRATIQUE DES MALADIES DES YEUX DANS LES HOPITAUX DE PARIS. (The Treatment of Diseases of the Eye in the Hospitals of Paris). By PAUL LEFERT. Paris: J. B. Baillière et Fils. 1895.

This little volume is one of a series for the general practitioner. It gives the formulas usually employed in the treatment of eye diseases by forty-five Parisian oculists and may well be a help to those not well versed or daily engaged in the special practice. For convenience the subjects are alphabetically arranged.

A TREATISE ON THE NERVOUS DISEASES OF CHILDREN. By B. SACHS, M.D. 688 pages with 169 engravings and a colored plate. New York: William Wood & Co. 1895. Price, Muslin, \$5.00.

As the title states, this book details particularly the nervous troubles found in children, while such forms of nervous diseases, as are more peculiar to adult age are omitted. The clinical pictures are clear and well drawn and a great deal of attention has been paid to the anatomy and pathological anatomy. This work may, therefore, be recommended as a welcome supplement, to other text-books on nervous diseases.

ALT.

SOCIETY PROCEEDINGS.

NEW YORK ACADEMY OF MEDICINE.

SECTION ON OPHTHALMOLOGY AND OTOTOLOGY.

May 20, 1895. JOSEPH A. ANDREWS, M.D., Chairman.

PYRAMIDAL CATARACT.

DR. STAFFORD.—I present this somewhat unique case to get the opinion of the members. The parents of the child assert that the anterior polar cataract was not perceptible before the time of the first convulsion, which occurred when the child was about two months old. It is now nine months old. It has had a few convulsions since then, but none lately. There is absolutely no sign of perforation of the cornea, and these opacities of the anterior capsule do not seem to extend into the lens substance, but project. I would like an opinion as to whether it is of the proliferating type, or simply a deposit of calcareous material. I also wish to know whether an operation is advisable, and if so, whether it should be discission, or a peripheral capsulotomy and destruction, or simply an opening into the anterior chamber and delivery of these opacities.

DR. WEBSTER.—It seems to be an ordinary case of capsular cataract. It would be a little extraordinary if such an opacity were noticed until there was something to call special attention to it in a baby less than two months old. I think any operative interference would be unjustifiable. With the ophthalmoscope there is seen a clear red reflex. I think these central opacities of the anterior capsule will interfere very lit-

tle with the vision. Of course, if it should take a course contrary to the usual one, and the child should develop cataract sufficient to interfere with the vision very seriously, that would be a different matter. In such a case, I think that I would "needle" until the lenses were absorbed, and then make an incision through the corneal margin, seize those opaque masses with delicate forceps, and pull them out with as much of the capsule as might come with them. I would not seize and pull them out before the needling.

DR. W. M. LESZYNSKY.—I can not conceive of the condition being the result of a convulsion in the child. It is the custom among the lower classes to raise the lid and open the child's eye; that might account for their having noticed it just at that time.

DR. E. GRUENING.—The opacity which we find here would very likely not interfere with the use of the eye, and it is certainly not justifiable to perform any operation. We can certainly not attribute the development of pyramidal cataract to the convulsion.

SARCOMA OF THE CHOROID.

DR. WEBSTER.—In this case there is a peculiar detachment of the retina. There is no waving of the retina on moving the eye. It is a rounded tumor, and yet it does not look exactly like other sarcomata of the choroid that I have seen. The vision is very much less than I should think it ought to be. The optic nerve, retina, and other parts look apparently healthy. It does not appear to interfere with the central vision and yet the vision is only $\frac{16}{c}$.

DR. JOHNSON.—This is certainly a most interesting case. There is undoubtedly elevation of the retina, and that elevation is certainly of such a character that it would seem to indicate the presence of a growth beneath it. There are changes on the temporal side of the growth—pigment spots and degenerative changes—which seem to me to indicate that there is some solid substance beneath. I do not think it is hardly pos-

sible for a sub-retinal fluid to be so extremely tense that there should not be the slightest movement or fluctuation in the growth.

DR. H. H. SEABROOK.—I think the vascularization is very suspicious. I saw, deep in the upper part of the growth, a few small vessels, which can not be traced into the retinal vessels.

DR. WILBUR B. MARPLE.—There is a reddish-white reflex observed, with a strong convex lens, and one can distinguish the vessels apparently quite independent of the retinal vessels.

DR. GRUENING.—I am inclined to think that we have to deal here with a neoplasm. The appearance of detachment in the emmetropic eye, without injury, is very rare. I examined both eyes without knowing which one was affected, and I found that the sound eye was softer to the touch. However, the personal equation comes into play here, and the other examiners may not agree with me. Again, the region is one where the retina does not readily become detached, and it is absolutely essential that there should be something to push the retina forward. Moreover, there is absolutely no wave. It is a globular mass such as I saw recently in a case of tumor of the choroid springing from the muscular origin. There also the detachment did not occur at a very early period. The retina was in contact with the mass, and I could diagnose the tumor, when it was not larger than a split pea. I saw, however, the vessels distinctly belonging to the mass. It was a leuco-sarcoma, and therefore the vessels could be seen. In melano-sarcoma the vessels are not seen. I think that there is a layer of fluid between the mass and the retina, because there is a certain transparency, and a red reflex from the deeper parts. If this be a sarcoma, the eye should be promptly removed, whereas if the retina were detached, this would not be the proper treatment. I would favor, therefore, an exploratory operation.

A HIGH DEGREE OF HYPERMETROPIA.

DR. WILBUR B. MARPLE.—I have never seen before a

hypermetropia of more than eight diopters, but this boy has at least fourteen diopters.

DR. WEBSTER.—It is true that these cases of high degree of hypermetropia are rare, but I think I have seen cases of even higher degree. I have seen at least two cases in the last twenty years where the patient, in order to read, slid the print along his nose, so that his nose was constantly blackened by the printer's ink. The degree was measured by the ophthalmoscope.

DR. GRUENING.—I have never seen before a case of more than nine diopters of hypermetropia.

DR. MARPLE.—The sight is improved slightly by glasses. He is able to read with a strong convex lens, and can not read at all without it.

DR. SEABROOK.—A case of twenty-four diopters has long been on record. I have records of some thousand cases, yet in none of them did the hypermetropia exceed eleven diopters.

SUGGESTIONS REGARDING LEGISLATION FOR THE PREVENTION OF BLINDNESS.

DR. W. B. JOHNSON.—In a carefully prepared paper, read at the November meeting of the Medical Society of the County of New York, Dr. Charles H. May tabulated all the diseases of the eye for eight years, treated in an eye and ear institution in New York City. In 1888, 1889, and 1890 there were 76,366 cases of eye disease treated, of which 452 were ophthalmia neonatorum—5.92 per thousand—while in the same institution during 1891, 1892, and 1893, 97,493 cases were treated, of which 488 were ophthalmia neonatorum—5 per thousand. The decrease in the number of cases of ophthalmia neonatorum is less than one case per thousand of the eye diseases treated. On June 26, 1892, at a meeting of the New Jersey Medical Society, a committee reported the draft of an act to be recommended to the next Legislature regarding the care of infants suffering from communicable eye diseases. On February 4, 1895, an act was introduced in the State of New Jersey for the preven-

tion of blindness. "Should one or both eyes of an infant be inflamed, swollen, or reddened, or show any unnatural discharge after birth, the midwife, nurse, or relatives shall report the fact in writing within six hours to the local board of health, if there is no physician in attendance; and the board of health shall place the case in charge of a local qualified practitioner of medicine." The act seems to have overcome most of the objections against similar acts in other States. It passed both houses, and became a law on March 12, 1895. It compels the immediate placing of the infant under the care of a local practitioner. Copies of the act are sent to every nurse and midwife in the State.

The question of the advisability of placing the disease ophthalmia neonatorum upon the board of health's list of infectious diseases was favorably considered by the committee. In the opinion of the writer, the reporting of all cases of ophthalmia neonatorum to local boards of health should be compulsory.

DR. HENRY W. RING, of New Haven.—I have been especially interested in this particular subject. A similar law was recently passed in Connecticut, and I thought then it was the best law up to date; the New Jersey law, however, seems to be still better. The statistics prepared by Dr. May were very valuable to many of us, and he deserves a good deal of credit,

DR. CHARLES H. MAY.—I think that the law, as passed in New Jersey, is an excellent one, and I expect to borrow its phraseology in my attempt to have an improved New York State law passed. One very valuable part of the New Jersey law is the provision for distribution of copies of the law among practitioners, nurses, and midwives. In New York City, the majority of general practitioners, and probably half of the oculists have a very indefinite knowledge of the provisions of the present New York State law.

DR. GRUENING.—This law will probably be inoperative, because in many country towns there are no local boards of health.

DR. JOHNSON.—In the country places they do not have

ophthalmia neonatorum. In the city gonorrhœa is easily contracted. In New Hampshire, where I spend a part of the summer, I have never seen or heard of a case. The more populous townships in New Jersey have local boards of health. I think all our efforts should be directed toward placing the disease upon the infectious and contagious diseases lists of the boards of health. These boards will then be interested in having it reported.

ACCOMMODATION IN OLD PEOPLE.

DR. H. H. SEABROOK.—I propose to give in detail a number of clinical records. These uncomplicated cases will be sufficient, I think, to demonstrate that accommodation does not disappear in old people. Indeed, I see no reason why it should do so, as the ciliary muscle in old persons is not absolutely powerless and the cortical fibers or the lens retain their elasticity. A safe deduction from these cases would be that the near point recedes progressively, but irregularly, as age advances.

DR. JUSTIN L. BARNES.—I have noted, in a great many cases of presbyopia, that the glass which I finally ordered for a patient was considerably weaker than was supposed to be called for by the table of accommodation, or presbyopia correction for a given age. Several years ago, when ophthalmology was newer to me than now, I asked a prominent ophthalmologist in this town what that signified. He said it implied approaching dissolution. When I saw my next case and gave a glass that was half as many diopters as strong as was supposed to be indicated, I took a note of that patient, and watched for the death notice in the papers. That patient is still alive. I should like to ask if the notion that approaching death is indicated, has any foundation in fact.

DR. WEBSTER.—I never heard of that notion before. We all know of the refraction changes in old people, and that sometimes they require weaker glasses than they have been using. Such cases belong in the same category with those of

"second sight," where there is atrophy of the periphery of the lens, and perhaps increase in the index of refraction, and where the eye becomes to a certain extent myopic. By just so much it requires a weaker glass for reading. I do not think that any one could have practiced ophthalmology in this city ten or fifteen years without coming to the conclusions reached by the reader of the paper. The Donders lines are altogether schematic. The age in a general way has something to do with the amount of presbyopia. The older a man is, the stronger the glass he takes, and, as a rule, the lens is his accommodation, but this rule is subject to great variations.

DR. SEABROOK.—These cases I find very difficult of explanation—these hypermetropes who have no accommodation for distance, and still can accommodate for reading. The only hint at an explanation is that when the pupil is contracted, the refraction is far higher at the center of the lens than at the sides; but that seems to me a somewhat lame explanation. The explanation given for so-called "second sight" is also unsatisfactory.—*American Medico-Surgical Bulletin.*

SELECTIONS.

STRABISMUS AS A SYMPTOM, ITS CAUSES AND ITS PRACTICAL MANAGEMENT.¹

BY LEARTUS CONNOR, M.D., DETROIT, MICH.

Landolt in his classical work says: "A strabismus operation, when undertaken without an exact knowledge of the optical and muscular functions of the eye, is but a rude and dangerous experiment." The reason for this statement springs from the fact that strabismus is merely a symptom of numerous pathologic and congenital defects, and its rational management calls for the study and removal, or correctness of these, so far as is practicable. The story of strabismus well illustrates the persistency by which the profession traces a symptom to its origin, in order that its cause may be removed and the symptom cured. Failure of squint operations has led to such a study as revealed the reasons for the past defects and the methods for future success.

At present we know that some cases of squint are readily curable, that some are incurable, and others doubtful, calling for additional study ere they can be classed either as curable or incurable. Diefenbach operated first for convergent squint in 1839, by dividing the belly of the internal rectus muscle. His operation was based upon the analogy of operations upon contracted muscles in other portions of the body. He reasoned, that since division of contracted muscles or tendons

¹Read before the Michigan State Medical Society, June 7, 1895.

elsewhere, restored muscular equilibrium, it should do so in the ocular muscles. He neglected to note that the problem of contracted ocular muscles differed radically from that presented elsewhere, in that opposing recti and their associated elastic tissues constantly tended to separate their divided ends! Hence the results obtained by himself and others were so frequently disappointing and actually disastrous that, except for the radical change introduced by Boehm, the operation must have passed into merited oblivion. This transferred the site of the operation from the belly of the muscle to its tendinous insertion, thus leaving the capsule of Tenon mainly undisturbed. The technique of the operation was so perfected by von Graefe as to render it easy and safe of performance; especially useful was his method for either increasing the effects of a tenotomy or diminishing the same.

The ophthalmoscope enabled us to see that some cases of squint were due to diseases of the refractive portions of the eye, distorting the passage of the rays of light in their course to and from the retina, or in case of disease of the optic nerve, cutting off the power of transmitting the impression made by the rays of light upon the retina, to the brain.

Not a few cases were traced to corneal opacities. Eyes entirely blind were found to often squint. Thus the symptom squint was traced to a variety of pathologic conditions, having one common feature, viz., they rendered the vision of the two eyes unequal and so deprived them of the 'guiding sensation.' With these facts in mind it is clear that a squint operation, without previous careful ophthalmoscopic examination, must be "a rude and dangerous experiment."

Donders' studies of refraction and accommodation traced this symptom to other and more common sources. Thus he showed that three-fourths of the cases of convergent squint were hyperopic, and an equal proportion of the cases of divergent squint were myopic. He also pointed out the intimate relationship between convergence and accommodation, a physiologic fact which anatomic researches have supported, by demonstrating the close relation of their centers in the floor of

the fourth ventricle. When the eyes accommodate for near objects by the contraction of the ciliary muscle, they also converge by the contraction of the internal recti. The bearing of this fact upon the causation of squint is apparent, when it is remembered that the hyperope is compelled to accommodate at all distances, and so the ciliary muscles are in a state of constant tension, and with them the internal recti. The flattened eyeball of the hyperope has broken the harmony which should exist between convergence and accommodation. Thus, if the hyperope accommodate for twelve inches, as in reading, the convergence will be at a point less than twelve inches if the muscles are of normal power. The result is a diffusion of impressions upon the retinae, to escape which the squinting hyperope turns one eye in and fixes the other at twelve inches, ignoring the impression of the squinting eye. A repetition of such acts forms a squint habit, which, while at first alternating, at last usually becomes fixed. The habitual suppression of the image in the squinting eye is followed by a loss of the power of perception—a loss which can be repaired if the retinae be normal at the first. Thus we have convergent squint due to eyes defective in the length of their antero-posterior axis. To the query, Why all hyperopes do not squint, it is replied that in those who do not squint, the normal balance between the power of the internal and external recti is so changed that, instead of being 4 to 1 it is less, only 2 to 1 or even 1 to 1. Hence in the non-squinting hyperopes, the excessive convergence required for distinct vision is balanced by the weak interni, so that the eyes remain straight. If the externi be much in excess of the interni, we have a hyperope with divergent squint. In support of this view of the causation of squint, advanced by Valk, I have habitually found all hyperopes to have weakened interni, as measured by the standard of 4 to 1.

Donders found that myopes needed little or no accommodation, because the eyeballs were already too long; hence the convergence in near seeing would be *nil*, and so if the strength of the recti was normal, the eyes would turn outward and give

a divergent squint. But if the externi were weak the eyes might remain straight, or if very weak they might turn in and give a convergent squint. Aside from muscular action in causing divergent squint in myopes, we have the elongated antero-posterior shape of the eyeball; the greater distance between the temples of myopes; variations of the orbital fat, and of the attachments of the ocular muscles to the bony walls.

These studies in refraction, accommodation and action of the external muscles of the eyes have led to far reaching consequences in the management of the symptom of squint. Thus it has been shown that some cases of convergent squint can be permanently cured by the wearing of such convex glasses as fully correct the abnormal flatness of the eyeballs; that some cases of divergent squint can be cured by the wearing of concave glasses, which reduce the refractive power of the eyes to their normal standard. The symptom disappears when we have restored the lost equilibrium between the refraction, ciliary and recti muscles.

As the nature of mydriatics became understood, it was found that their use in paralyzing the accommodation, permitted the recti to assume their normal functions, and so facilitated a cure of cases in which the squint persisted after the defects of refraction had been corrected by appropriate glasses.

Statistics on a large scale, show that while tenotomies and advancements cured many cases of squint, the intelligent correction of refractive defects and the use of mydriatics cured many additional cases, added to the number of those who secured binocular vision and diminished the number of divergent squints following tenotomies. Thus by distinct lines of evidence we have traced the symptom squint, in many cases to defects of refraction, and abnormal ocular muscles. This result is still further confirmed by recent studies of those similar disturbances of muscular equilibrium known as insufficiencies or heterophorias. These studies have encouraged surgeons to seek binocular vision in the management of squint, rather than rest content with the straightening of the eyes, because they have given us finer and more precise methods of operat-

ing and more suitable instruments, both for determining the muscular disability and for doing the operations; in short, they have furnished us with a micrometer adjustment for the doing of squint operations, and so raised them to a higher perfection.

Finally, squint has been traced to a defective structure of the retinal percipient elements, congenital in its origin, unchangeable in character, and causing an inability to see other than large objects. Upon these eyes, neither glasses, atropin, or tenotomies have other than a cosmetic effect; only operative procedures avail aught in their management.

Having collected all existing knowledge respecting squint, we see still vast fields, uncultivated fields adequate for the surplus energies of more than a generation of physicians. Thus we want a comparative study of the origins and insertions and other relations of the ocular muscles; the modifications of their activities by the varied shapes and sizes of the eyeballs, by the individual peculiarities of the capsule of Tenon, by the quantity and quality of the orbital fat or the fibrous stroma which holds it in place. We want a comparative study of the orbital walls, as bearing upon their contents, and the functional activities of the eyes. We have still much to learn of the nervous apparatus of the eye and its muscles, of its visual and motor centers, and of the complex relationship of this apparatus to other organs; in fact, time fails us to even enumerate the fields awaiting investigation, in their relation to the causation and management of squint. However, our present knowledge enables us to attain very satisfactory results in an increasing number of cases. It is a marked advance in that we aim, not only to straighten eyes, but to have the patient possess binocular vision. This is attained by supplementing the operations for squint with gymnastic exercises, innervation treatment or partial tenotomies, until we have enabled the eyes to fix upon any point in the visual field. This necessitates a cordial co-operation of physician and patient during an extended period, varying with individual cases.

For convenience the management of squint may be divided into operative and non-operative. The operative

measures are tenotomies of the stronger muscles or advancement of the weaker ones; both of which may be needed in the same case.

The non-operative means are:

1. Careful attention to the patient's constitutional condition.
2. The correction of all defects of refraction, so far as these affect the squint unfavorably—the correction to be made from data obtained while the eyes are fully under the influence of atropin.
3. The continued use of mydriatics.
4. The use of gymnastic exercises, or the innervation treatment of Gould, to increase the power of the weaker muscles, or to bring them into operation with the stronger.

In each case the surgeon is met with the question, Is this an operable one? To aid in answering this, I give brief extracts of four typical cases, whose condition I was able to record many years after the treatment—affording the final results of the management of convergent squint:

CASE I.—Boy aged 5, strong, with marked convergent squint of the left eye, noticed when six months old. An examination with the ophthalmoscope showed healthy ocular media; vision of right eye was $\frac{20}{xx}$; of the left $\frac{20}{cc}$. Under a mydriatic the ophthalmoscope showed a hyperopia of a dioptric and a half. The full correction of this was prescribed, and the ciliary muscles kept fully under the influence of atropin, but at the end of six months the result was negative. The internal rectus tendon was now divided and the other treatment continued, with the final result of leaving the eyes perfectly straight, but with no improvement of vision even fifteen years after the tenotomy. This was clearly an operable case, as nothing but the tenotomy changed the squint, and even it failed to improve the vision. Such cases are defective in the precipient elements of the retina of the squinting eye, or its optic nerve relations.

CASE II.—A healthy girl aged 9; convergent squint of right eye since one year old, at first alternating but finally fixing; the ophthalmoscope showed perfectly healthy media, in both eyes, and a hyperopia of two dioptrics in the right eye and one and a half in the left; vision of right eye was $^{20}/_{cc}$; of left eye $^{20}/_{xl}$. Full mydriasis and correction of hyperopia failed to benefit the squint, so that a tenotomy of the right internal rectus tendon was done. This failing, a month later the left internal rectus tendon was divided, with the result of making the eyes practically straight and after many months bringing the vision of each eye to $^{20}/_{xx}$. These two cases were alike in both requiring ocular tenotomy, but unlike in that the vision of the first was unimproved, while that of the second became normal, though the same methods were employed. The first represents a class of cases, congenitally defective in the precipient elements of one eye and so incapable of development; the second stands for a class in which vision is lost by non-use, but can be restored if the eye can be placed in such relations as will admit of the normal exercise of the retinal elements.

CASE III,—Boy aged 5; squint noticed when two years old; alternating then and at examination; vision of each eye $^{20}/_{xl}$; hyperopia two dioptrics, the correction of which gave a vision of $^{20}/_{xx}$, and rendered the eyes perfectly straight. Atropin was used six months and the correcting glasses worn constantly with the result that ten years later the eyes were straight and the vision binocular and normal.

CASE IV.—Boy aged 8; convergent squint of the left eye, noticed when a year and a half old as alternating but now fully fixed; ophthalmoscope revealed perfectly clear media, and a hyperopia in the right eye of two dioptrics, and in the left of two and a half; vision of right eye $^{20}/_{xxx}$; of the left $^{20}/_{c}$. Glasses correcting the hyperopia, both straightened the eyes and substantially improved the vision of the fixed eye. This improvement continued till vision of the squinting eye was equal to

that of the other, and nine years later the vision continued normal and the eyes were perfectly straight.

The last two cases were clearly non-operable. True, a tenotomy would have rendered the eyes straight, but later they would have diverged.

To avoid complexity, simple hyperopic cases are selected, but cases of hyperopic astigmatism, simple or complicated with hyperopia obey the same laws.

It follows that in every case of uncomplicated squint, the question arises, Does it belong to the class of congenital amblyopias or not? If the answer be affirmative, the case can be operated upon at once for cosmetic effect—there being no hope of improving vision. If the answer be negative, we must separate the operable from the other cases. The following has been found a safe method of procedure:

1. Eliminate all cases of paralysis.
2. With the ophthalmoscope, detect all squints due to opacities in the refracting media and treat them by operations, as in congenital amblyopias, for cosmetic effect merely.
3. Determine the vision of each eye, and the kind and degree of ametropia under mydriasis.
4. Correct the full amount of ametropia, and if this renders the eyes nearly or quite straight, an operation is inadmissible and the cases will probably go on to full recovery, under the use of glasses and atropia.
5. If glasses and atropin produce no perceptible effect upon the squint, then a tenotomy of one or both recti is indicated, followed by the use of glasses to relieve the eye strain and retain the eyes in the position resulting from the operation. The securing of binocular vision in this class of cases is materially aided by gymnastic training of the weaker muscles, and the co-operation of all.
6. The time for operating upon convergent squint depends entirely upon the ability of the surgeon to separate the

operable from the non-operable cases. An operable case is best treated as early as the co-operation of the patient can be assured—usually at about 6 years.

7. If glasses correcting the full ametropia be worn at an early date, the normal relations of convergence and accommodation are soon established, better developed during child growth, and the ultimate vision more perfect.

8. To secure the best results, calls for much attention to the management of these cases, during a period extending over months or even years.

9. As to the final balance of the internal to the external recti, a proportion of 4 to 1 has given the greatest comfort to patients, and the best vision under all circumstances.

CONCLUSIONS.

1. Strabismus is always a symptom of some morbid or congenital defect.

2. Success in its relief, has increased in direct proportion to our knowledge of these conditions and defects.

3. Strabismus due to opacities of the refracting media or to congenital amblyopia, can only be treated by operations, and solely for cosmetic effect.

4. Strabismus due to the combined action of hyperopia and normal recti, is treated by tenotomy or advancement, atropin mydriasis, suitable glasses and gymnastic or innervation exercises.

5. Binocular vision is to be sought for in all cases other than those due to opacities of the refracting media, congenital amblyopia or organic disease of the retina or optic nerve. With sufficient perseverance, it is attainable in a fair proportion of cases.

6. Recent studies of heterophorias afford substantial aid in the better management of squint, by the new standards of

both operative and gymnastic work, by the more convenient and reliable instruments for examination, and finer ones for operation.

7. There yet remain a number of cases of squint not explicable by our present knowledge, or amenable to treatment by accepted methods. To bring these under definite law, both as to cause and management, remains for the student of ophthalmology.—*Journal of the American Medical Association.*

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ORIGINAL ARTICLES.

A CASE OF PRIMARY CARCINOMA OF THE SPHENOIDAL SINUS.

BY DR. DOMBROWSKI, PEORIA, ILL.

The extreme rarity of malignant tumors originating in the sphenoidal sinus, is sufficient reason for publishing the following case:

Mrs. Wm. S., about 50 years old, from Hollis, Peoria County, Ill., consulted me on May 15, 1890, on account of impaired vision of the right eye. She noticed this six weeks ago for the first time, but is not sure if she ever has seen better with this eye. Her health has been excellent, save some headaches which she has had during the winter '89-'90. The headache would come on in spells, each attack lasting a day or so. She also has noticed a little occasional jerking in right temple.

Vision—R. $\frac{16}{L}$, R. slightest blanching of disc.

L $\frac{15}{XV}$, L., normal disc.

Visual field—R., slight, but distinct, restriction for white

and for colors on temporal side of visual field. L., normal.

There were no definite symptoms of cerebral or spinal affections, no history of a previous injury to the skull, no specific infection. Urine free from albumen and sugar. I also examined her nose at that time on account of some thickness in her voice, but I did not find anything abnormal. Mrs. S. was advised to take iodide of potassium, and to return if sight should fail any more.

Her next call at my office was four months later. She complained of her right eye getting worse, of continuous pain in her head, more in temples and in back of her head, and of a feeling of pressure in the temples. Otherwise perfectly healthy, except some pains in limbs, the lower part of which feel numb; feels also lame in back.

Sight R., $\frac{16}{LXX}$. Disc paler; visual field in all directions restricted, especially so on temporal side.

There was the same nasal twang in her voice as before. She also complained of a stopped feeling in her nose, worse at times. Examination of the nose negative, save some slight redness and congestion of the mucous membrane, which might have been due to a little cold; neither did a thorough examination of the posterior nasal space reveal anything of importance. I gave a guarded prognosis, and told her husband that I was unable to tell him the exact cause of the optic nerve atrophy. She was advised to take again iodide of potassium and bi-chloride of mercury.

I did not see her again until a year after this consultation (August 28, 1891). The right eye was now blind, and has been so for the last six weeks. The left eye commencing to fail. Her head has felt well during the whole winter and the first part of the summer, but it has troubled her very much the last two months. The pain is now mostly in the left temple, just above the level of left external canthus, one-half inch back of orbital edge. Last week she had this headache every day; it would begin about 2 P.M. and last until midnight. Sleep is good. At no time since commencement of her sickness has she had diplopia. Facial nerves free. No difficulty in speech

or in swallowing. Strength in both arms and limbs about alike. No objective disturbance of sensibility in face and body. No paræsthesiæ; hearing good; taste normal. Smell gone for two years. Had a violent cold two years ago; ever since that time she had been unable to smell. She has had no attacks of dizziness nor of vomiting.

Sight, R., light perception; atrophic disc. Sight, L., $^{20}/_{XL}$. Visual field distinctly restricted, especially for colors. The restriction is most marked in the temporal, upper and lower parts of the field. I also found, from several examinations during the last two months, that sight as well as visual field of the left eye were changeable. At times both improved. Her nose felt lately more stopped up than ever. I found this time (August, '91) a congested condition of the right middle turbinated body, and a thin layer of pale grumous-looking tissue between the middle turbinated bone and septum. This growth, for such it was, did not reach down below the level of the middle turbinated body. I removed a few pieces with the cold snare, and found, from microscopical examinations, that the tumor was a papillary carcinoma. As it was impossible to decide upon the origin of the growth (the middle turbinated bone being nearly in contact with the septum). Having removed the posterior two-thirds of the middle turbinated body with suitable trephine, I found that the tumor was situated in the region of the sphenoidal sinus, that the front wall of the sphenoidal sinus was destroyed by the tumor, and that I could with a sharp spoon remove pieces of the growth from the inside of the sphenoidal sinus. This growth seemed to invade also the posterior part of the ethmoidal labyrinth and the posterior upper portion of the septum. At a later sitting I removed the middle turbinated body of the left nose in order to examine the remaining part of the sphenoidal sinus. I then scraped as much as possible of the tumor away, and made a limited application of chromic acid, in order to find out how she would stand cauterization. I told her husband that the cause of the eye trouble was a tumor pressing upon the optic nerves, and

that it might be possible to remove the whole growth by a more radical operation.

This proposition was not accepted. She consulted a traveling specialist for catarrh, who treated her for about six months. In May, 1892, she called again at my office. Central sight of left was still $20/XL$, but the visual field much more restricted. She complained chiefly of not being able to breathe through her nose, and as she did not consent to any thorough operation I removed enough of the growth to restore nasal respiration. This was repeated again August, 1892. At this time I found parts of the new growth in the left side of the nose on a corresponding place, *i. e.*, up and backward at roof of nose, between septum and stump of middle turbinated body. The visual field of the left eye had shrunken considerably, especially above and below. S., $20/L$ still.

There were not yet any symptoms of involvement of the cranial nerves; no sign of meningitis, of thrombosis, of abscess. Memory and intellect were undisturbed. I again performed a palliative operation some months later at her home, as she did not feel strong enough to come to the city. Through her family physician (Dr. Schenck, Pekin, Ill.) I was informed that she died some months later under symptoms which pointed to some involvement of the cranial cavity. He could not get the consent for a post-mortem examination. This is to be regretted, as an autopsy might have furnished facts concerning the real extent of the growth, etc., but for a confirmation of the diagnosis, primary growth of the sphenoidal sinus, an autopsy was not necessary, as I will show further on.

* * *

The literature of cases of primary malignant tumors of the sphenoidal sinus is very scarce.

1. Albert¹ found accidentally at a post-mortem examination a *carcinoma of the sph. s.* The case had presented no special symptoms during life.

¹. *Erger and Tyrman*, p. 61.

2. Behring-Wicherkiewicz,² sarcoma or chlorosarcoma, originating in sph s. This case has been carefully examined during life. Man, 28 years. Suffered for some weeks from congestions to the head, occipital pains, a feeling as if the eyes might protrude from the sockets, ringing in the ears and hearing. Examination showed:

R. eye some exophthalmos, dislocation down and in, lobulated tumor in region of lachrymal gland. Sight ²⁰/_{xxx}. (Sight left eye ²⁰/_{xx}). Visual field free in both.

Ophthalmoscope showed in both eyes; disc margins somewhat hazy, with dilated veins. A few years later walls of bloodvessels considerably thickened, in shape of dark stripes. Wicherkiewicz took these dark stripes for hæmorrhages, but examination after death showed them to be neoplastic infiltrations of walls of bloodvessels.

Ears: R. watch 26c., L. w. 5c. (drum in left hyperæmic). Sight failed quickly. One week after first examination R. ⁶/_{xxxvi}, L. ⁶/_{xviii}. A few days later total left facial paralysis. Left mastoid process tender and swollen. Sight, R. fingers 6 feet, L. 10 feet. White patch in macula of right eye.

Exophthalmos of right eye quickly increasing (with perforation of cornea). Finally increase of noises in left ear, metastases on sternum, apoplectic seizures, somnolence, death (two months after first examination).

Post-mortem examination (Ponfick). Tumor is a sarcoma, mostly round cells, some spindle-shaped cells, of a green color (chlorosarcoma), which, according to all appearances, originated in the sphenoidal sinus, perforated its anterior and lateral walls (into nasal cavity and into orbit), and finally its upper and posterior walls (into middle fossa of skull). At the same time the growth spread along the canals of the bone of base of skull to the petrous portion of temporal bone, from here to the tympanum, which is partly filled with the tumor; mastoid cells filled too. The left facial nerve is compressed by the tumor at the stylo-mastoid foramen.

²Ibid, p. 68, 69.

These are the only two cases of primary malignant tumors of the sphenoidal sinus on record (as far as I know). One of these two cases (Albert) is of no value, having no clinical observation. The other case (Behring-Wicherkiewicz) is a sarcoma. My case is a papilloma carcinomatosum.

Lotzbeck's³ case is not a primary carcinoma of sph. s. The thyroid was first affected; secondary deposit in inferior maxilla, giving rise to fatal hæmorrhage. On autopsy a third deposit was found, which had destroyed the basilar process of occipital bone, and the body of the sphenoid, and entering the cranial cavity, had filled up the greater part of the right middle cranial cavity, and also the left to some extent. Right antrum and orbit, and to a slight extent left orbit had become involved. Symptoms were: First, amblyopia and amaurosis of right eye, headaches, exophthalmos, sudden amaurosis of left eye (coming on within six hours).

Of other primary tumors of the sphenoidal sinus Berger and Tyrman mention a few cases of polypoid growths, of osteoma, and a number of cases of exostoses.

The symptoms of tumors of the sphenoidal sinus are as follows:

1. As long as the tumors are confined to the cavity and exert no pressure upon its walls, we have either no symptoms at all or only headaches.

2. When the tumor, during its growth, presses upon the walls of the cavity, the lateral walls of the cavity, being the thinnest, will likely yield first, and exert a pressure on the optic nerve. We will then notice amblyopia, limitation of the visual field and later amaurosis, first of one and then of the other eye. We have to remember that the optic nerve lies close to the lateral wall of the sphenoidal sinus. Zuckerkandl has made frontal sections of the sphenoidal bone, in the region of the optic foramen, and has shown the great variations in the thickness of the long wall separating the optic canal from the sph. s. Usually this wall is very thin, and offers very little

³Bosworth, Diseases of the Nose, Throat, Ear, etc., Vol. I, p. 613.

protection for the optic nerve from tumors within the sph. s. But in some cases the bony partition is very heavy; the patient might die from propagation of the tumor into the cranial cavity without having shown optic nerve symptoms. There are also skulls where the separating bony wall is very thick on one side and thin on the other.

It is a question if a special kind of limitation of the visual field is to be found in all those cases of optic nerve compression which have their origin in some pathological dilatation of the sph. s. I hardly think so. The pressure may be exerted on different bundles of the optic nerves; it is not necessary that those fibres which are situated medially suffer first. The perforation or bulging of the wall may happen to be in such a place that the upper and lower fibres are first acted upon. It is moreover doubtful if in all cases the uncrossed fibres (*i. e.*, those which do not cross within the chiasm, and which provide the temporal half of each retina) and the crossed fibres occupy the same relative position within the optic canal. Schmidt-Rimpler⁴ thinks that the uncrossed fibres are situated on the median side (conclusion reached from a case of cortical hemianopia with secondary atrophy). Wernicke⁵ is of the same opinion. *A priori* one would expect just the opposite arrangement, and most other observers stand for it, for instance Delbruek⁶ and Siemerling.⁷ Sebold⁸ has a still different opinion. He says: The crossed bundle lies more in the center of the nerve, surrounded peripherically by the uncrossed bundle. The latter arrangement (crossed fibres in center, uncrossed in periphery) was found by Schmidt-Rimpler only in that part of the optic nerve which lies directly behind the eyeball, while further back, especially within the optic canal, the crossed fibres lie laterally (as stated before).

⁴Archiv fuer Augenheilkunde, 1888, p. 296.

⁵Lehrbuch der Gehirnkrankheiten (Wernicke), p. 75.

⁶Archiv fuer Psych. and Nervenhe., XIX.

⁷Centralblatt fuer Augenheilkunde, 1890, 540 Referat.

⁸Centralblatt fuer Augenheilkunde, 1891, p. 517 Referat.

All admit that the fibres for the macula lutea are placed centrally (within the optic canal; further down it is different; the more the nerve approaches the eye the more laterally this macular bundle lies). The macular fibres are thus fairly well protected against any pressure of moderate degree within the optic canal. This might explain why in my case the central vision of the left eye was good at a time when the visual field was greatly restricted.

In the Behring-Wicherkiewicz case (primary sarcoma of sph. s.) the sight of both eyes was destroyed very rapidly (first right then left). We find: Sight, R. $\frac{20}{xxx}$, L. $\frac{20}{xx}$. Visual field free. Five weeks later both eyes blind (on right side with exophthalmos plus perforation of cornea; tumor had spread into orbit; left side without exophthalmos). The condition of the visual field of left eye on November 20 was as follows: Concentric peripheral limitation, which amounted to $10-15^\circ$ on median side, while laterally a scotoma of $15-20^\circ$ was found.

3. In its further growth a tumor of the sphenoidal sinus will spread into one of the neighboring cavities, and we have then symptoms which point to the co-involvement of either the orbit or nasal cavity and nasopharynx, and cranial cavity. The orbit can be reached either directly from the sphenoidal sinus or indirectly through the ethmoidal sinus; the nasopharynx either directly by perforation of the lower wall of the sphenoidal sinus, or indirectly from the nose (perforation of the front wall). The cranial cavity may be reached either directly from the sphenoidal sinus, or indirectly from ethmoidal cells, orbit or nasal cavity.

The chief symptoms of involvement of the orbit are exophthalmos and dislocation of the eyeball in different directions, mostly towards the lateral side. When the nose and nasopharynx are attacked we will find more or less obstruction in nasal respiration, and an examination will show the presence of a growth in these localities. The cranial cavity may become co-affected without there being any symptoms pointing to this complication; especially so when the invasion oc-

curs very slowly. In other cases increased headaches or epileptic seizures mark the beginning of the invasion.

When I now return to my own case and recapitulate that the symptoms presented were headaches in spells, with progressive amblyopia, first of one eye then of the other with visible blanching of the optic nerves; that I further found a tumor pushing itself down between the posterior part of the middle turbinated body and the septum (right nasal cavity), and that I was able, after having removed a part of the middle turbinated body, to demonstrate the presence of the growth in the sphenoidal sinus; no other diagnosis could be made than that of a primary tumor of the sphenoidal sinus. It could never have been a primary tumor of the postnasal space, with secondary involvement of the sphenoidal sinus. I have operated upon many cases of naso-pharyngeal growth, and am well acquainted with their symptoms. I repeat again that at a time when there was already pronounced amblyopia of the right eye, neither the examination of the nose (with the aid of 15 per cent. cocaine, in order to produce thorough shrinking of the mucous membrane) nor the examination of the post-nasal space (with palate hook and mirror) showed the presence of a growth. I repeatedly made these examinations on account of the peculiar nasal character of her voice. All I could detect was some congested, swollen condition of the mucous membrane in the nasal cavity. I could mention here a number of cases of tumors of the post nasal space which forced their way into the sphenoidal sinus and then produced symptoms similar to those of a primary tumor.

I refer the reader to the collection of cases of carcinoma and sarcoma of nasal passages given by Bosworth in his book "Diseases of the Nose and Pharynx." Some of these cases show secondary involvement of the sphenoidal sinus.

One possibility, however, still presents itself. I have a skull in which the outer wall of the sphenoidal cavity does not form the wall of the optic canal. The posterior ethmoidal sinus reaches far back, terminating exactly at the optic foramen. The sphenoidal sinus lies under the sella turcica. The

osseous lamella separating the optic canal from the ethmoidal sinus is in this specimen very thin, while the anterior lateral wall of the sinus, bordering the orbit, is of much greater thickness. I do not doubt that the possessor of this skull, if attacked by a tumor of this ethmoidal cell, would have shown symptoms of pressure upon the optic nerve at a very early date, and might have escaped exophthalmos (so characteristic for tumors of the ethmoidal sinus) for a long while.

Berger-Tyrman, too, mention this abnormal situation of the ethmoidal sinus. They say they have seen two skulls in which the ethmoidal labyrinth extended so far back that the anterior wall of the sphenoidal sinus was posterior to the whole optic canal. In such a case a tumor of the sphenoidal sinus can not exert any pressure upon the optic nerve until it has spread from the sphenoidal sinus to the ethmoidal, and filled both cavities. How often such an anatomical arrangement exists I can not say; maybe that dolichocephalic and brachycephalic skulls differ in this respect. As far as the case reported is concerned, I do not believe that the tumor originated in such an abnormally situated posterior cell. The perfect absence of exophthalmos on the right side is not in favor of such an assumption. And another point. If the papilloma had originated in the right (abnormally located) ethmoidal sinus, it would be difficult to understand how it would have produced amblyopia of the second eye at such an early date.

Tumors of the ethmoidal sinuses, as long as they are enclosed, either make no symptoms at all or occasional headaches and fullness or a stopped up feeling in head and nose. Should (in very rare cases) the posterior ethmoidal sinus extend so far back as to lie on the inside of the optic canal, then a tumor originating in this region may occasion amblyopia at an early date. It is also possible that by influencing the venous circulation in the orbit, any tumor of the ethmoidal sinus could affect the central vision and the visual field. But this is a point concerning which observations are still wanting.

In its further growth the tumor will present symptoms of *involvement of the orbita* (exophthalmos, dislocation of the bul-

bus in various directions, diminished vision and restricted visual field, diminished mobility of the eyeball). The orbita becomes involved either by perforation of the lateral wall of the ethmoidal labyrinth or by a gradual displacement of this wall into the orbit. Or we find symptoms of *involvement of the nasal cavity* (corresponding side of nose stopped, septum pushed to the other side). The extension into the *cranial cavity* can occur under varying symptoms.

Primary malignant tumors of the ethmoidal sinus are as rare as those of the sphenoidal sinus. There is no case of sarcoma on record, and only three cases of primary carcinoma. These are :

1. Billroth's case of papillary carcinoma.

2. Hoffman's case of papillary carcinoma, with recovery. This was in a man of 44 years. Right nose stopped by a tumor; septum pushed to the left. Tumor of a pale, reddish-grey color, and cauliflower-like appearance. Can be felt from the post-nasal space. Operation according to Demarquay and Bruns. Ethmoidal cells were found to be the starting point. Thorough scooping of the whole labyrinth up to the lamina papyracea. Several relapses occurred, which were treated with chloride of zinc paste. At the time of the report, the patient had been free from any relapse for eighteen months. Hoffman believes that these papillary carcinomata are clinically benign tumors, though they resemble carcinomata in their histological characters.

3. Gerdy's case of carcinoma of ethmoidal labyrinth, with perforation into cranial fossa.

I would like to add a few remarks concerning the growth itself. Microscopically it exactly resembled the description given by Hoffman for his case of papillary carcinoma. The tumor (in my case) was of a pale, reddish-gray color, and of very soft consistence. It easily bled at the slightest touch. The surface looked granular, each granule being one-sixth to one-half pin-head in size. The granules touched each other closely, but one could easily see that they were separated from each other by interstices between them (cauliflower-like

appearance). A small piece of the tumor was placed in a test tube and shaken with some water. The clear water soon changed into a milky-looking fluid from the admixture of innumerable cells, which separated themselves from the surface of the tumor. The remaining part of the tumor, freed from its cells, resembled in structure a coral tree. The cells do not simply cover the surface of the tumor in one or two layers, but form large colonies of regular, beautiful structures, which fill up the hollow places left at the surface of the tumor between the terminal branches of the connective tissue trunk. Or, as it might be described as well, they are arranged in multifold layers around the terminal branches of the trunk. In some of the sections I found large epithelial nests enclosed within the substance of the smaller and larger branches. The cells within these nests were of the same appearance as those on the outside of the tumor. The growth contained blood vessels in varying numbers. The greater part of the tumor was moderately rich in vessels; other parts were full of them, and some of the terminal branches looked more like angiomaticous growths, being made up entirely of dilated, extremely thin-walled blood vessels, over-distended with blood. In some specimens the blood had fallen out from these vessels, permitting a direct inspection of the remaining walls. Extravasation of blood was found in many places too. No doubt that interference with free circulation had led to secondary changes in the tumor.

I wish to close this paper with some remarks concerning the management of such cases. I believe it to be our duty in a case of optic nerve atrophy occurring without apparent cause, to remember the possibility of such cases having their origin in the sphenoidal sinus. We ought to search for symptoms pointing to the nose (persistent stopped up feeling, nasal twang in voice, one-sided discharge from nose), and if suspicion is justified, a piece of the middle turbinated body should be removed in order to directly examine the sph. s. by ocular inspection and by the probe. I do not doubt that some of these cases will give a better prognosis when recognized

early and treated appropriately (removal of front wall of s. s.; scraping; cauterization).

Those readers who are not acquainted with the literature of the subject will be interested in the case of Priestly Smith.⁹ This case was not a primary tumor of sp. s., but one of the post nasal space with secondary involvement of sph. sin.; besides it can not have been a sarcoma nor a carcinoma. But it is of great interest, as the ocular symptoms were well pronounced.

F. 25y. 6 Nov. 1874. Sudden impairment of sight in both eyes. Next day sight of right eye better. Nose often stopped. Purulent, bloody discharge. Much headache.

May, 1875. Left eye blind. Another spell of great impairment of sight in right eye. Sick a few days with much pain in head, temples and nose. A growth was removed from right nasal cavity.

June, 1875. S., R. $20/_{xxx}$. Visual field normal. Ophthalmoscopically normal. Left blind. Nose stopped.

September, 1875. Again spells of blindness in right eye. The blindness always begins in the temporal half of the visual field. Sight returns in the same way. With each attack of blindness she has pain in temple and forehead for 1-2 days. Always worse when nose does not run.

December, 1875. S., R. $20/_{xx}$. Left blind (with optic atrophy). Large tumor removed from post nasal space in the General Hospital of Birmingham.

August, 1882. Sight, right eye, good. Still some discharge from post-nasal space. When this ceases the sight in the right eye becomes slightly veiled. Smith thinks that the veiling is due to pressure upon the optic nerve within the optic canal. The pressure is brought on by some affection of the sph. s., and is due either to some accumulation of purulent discharge or some sudden increase in the swelling.

⁹Ophthalmic Review, 83 (June).

SOCIETY PROCEEDINGS.

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

Thursday, May 2, 1895. D. ARGYLL ROBERTSON, M.D.,
F.R.S.E., President, in the chair.

* * *

A NEW OPERATION FOR PTOSIS.

DR. MULES read a paper on this subject. The operation was first described by the author at the last International Congress of Ophthalmology at Edinburgh, in August, 1894. He now gave the results of his further experience of its effect. The principle of the operation was to substitute the frontalis muscle for the levator palpebræ by the following method: Two needles with eyes near their points were passed deeply through the frontalis tendon over the eyebrow, and their points brought out at the margin of the lid behind the lashes, taking up a substantial part of the tarsal cartilage on their way. A piece of silver wire was threaded through each needle, which was then withdrawn, leaving the loop of wire passing from the brow to the edge of the lid and back to the brow again. This was then tightened until the lid was sufficiently raised, the edge of the lid being slightly grooved by an incision to allow the wire to sink into the substance of the lid. One end of the wire was then passed transversely under the skin and made to emerge by the side of the other end of the wire. The two ends were then twisted on each other until the lid was raised permanently; the ends were cut off, and the wire allowed to

sink below the level of the skin. The skin at this point and at the lid margin healed over the wire, which remained permanently fixed in the substance of the lid. From further experience it was found that the wire remained in position without causing irritation; the lids could be closed, and remained closed during sleep. All kinds of wire had been tried, but it had been found that silver wire was the most satisfactory. It was necessary at the time of the operation to note the situation of the twisted end of the wire in case it became necessary to remove the suture afterwards.

THE PRESIDENT was struck by the correctness of the principle of the operation, which was to establish a better connection between the frontalis muscle and the lid. He feared, however, that the wire might give rise to irritation if left in the lid for a very long time; it was likely also to cut its way through the tarsal cartilage or the tissues of the brow, and thus lose part of its effect. A good operation for ptosis was much needed; Snellen's operation was complicated; Everbusch's operation was good in slight cases, but not in serious ones; Panas' operation was serious and disfiguring; the thread operation were not sufficient or permanent.

DR. BRAILEY thought it would be simpler to introduce the needles from below; he was quite satisfied with the thread operation.

DR. DONALD GUNN asked whether both needles could not be passed through one opening over the brow, so as to avoid the angle in the course of the wire.

Mr. Spencer Watson, Mr. Lawford, Mr. Cartwright, and Mr. Ernest Clarke also took part in the discussion.

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BLOOD STAINING OF THE CORNEA.

MR. TREACHER COLLINS read this paper. He found that this staining of the cornea, which was of a greenish or reddish brown color, was due to the presence of a number of highly refracting granules scattered throughout its substance. These granules were not located with any definite relation to the

spaces between the laminæ of fibrous tissue; they agreed in their spectroscopical appearances and chemical reactions with hæmatoidin. He found that in some of the cases associated with grannles of hæmatoidin was a substance which gave an iron reaction with ammonium sulphide, and which was probably hæmosiderin. In eyes in which this discoloration occurred, the tension was generally increased, the exit of fluid through the angle of the anterior chamber being obstructed by the presence of blood clots. He was of opinion that hæmoglobin first diffused into the cornea from the anterior chamber through Descemet's membrane, and that the hæmatoidin, which is insoluble in the fluids of the cornea, was then precipitated there. The whole of the cornea was at first affected, and when this was the case the condition could not be distinguished from that in which blood completely filled the anterior chamber. The absorption of the hæmatoidin granules began at the periphery equally in all directions, so that by degrees a narrow ring of clear cornea was formed surrounding the stained area. The appearances then presented were strikingly similar to those of a lens dislocated into the anterior chamber. The absorption of the granules becomes slower and slower the further they are removed from the sclero-corneal margin. He had seen one case in which the discoloration had completely disappeared in the course of about two years.

MR. JESSOP had had a case recently in which, as the result of an injury, the anterior chamber was half full of blood; there was also blood in the substance of the cornea, which disappeared after three days.

In reply, Mr. Collins thought that this case was quite different in character; it was a temporary transudation of blood or blood coloring matter into the corneal substance.

* *

SUDDEN SEVERE HÆMORRHAGE FROM THE CONJUNCTIVA OF THE LID.

MR. W. H. JESSOP read notes of this case. A woman, aged 27, was brought to St. Bartholomew's Hospital in a state

of collapse due to repeated attacks of bleeding from the left eye. When seen the pulse was 130, small, irregular, and difficult to count; the extremities were cold, and the right pupil dilated. On everting the lid, a small, jagged-edged ulcer, about $1\frac{1}{2}$ mm. in diameter, was found in the middle of the palpebral conjunctiva, from which bright arterial blood was flowing. The ulcer was burned by the actual cautery, and treated with cold compresses. With one slight exception it gave no further trouble. Fourteen years before the patient had had erysipelas of the eye and nose on the left side, since which time the lid had been slightly swollen. There was no history of severe hæmorrhage or of hæmophilia, and there had been no accident. The patient had been married twelve months, and had been pregnant seven months. The case was probably of nævoid origin, but it differed from the cases previously described inasmuch as there was no marked sign of vascular tumor. There had been only three cases described, but none of them were quite like this.

MR. SYDNEY STEPHENSON had lately had under his care a girl, aged 11, suffering from trachoma, for which the operation of "expression" had been performed. From that time spontaneous bleeding from the conjunctiva took place, and continued for more than five months. Although the patient had been repeatedly examined as soon as the hæmorrhage was observed, he had never been able to identify the point from which it came; the conjunctiva was uniformly red and turgid. The child was watched, but the hæmorrhage recurred again again under conditions which seemed to place malingering out of the question. There were no signs of anæmia, or scurvy, and hæmophilia seemed to be excluded by the fact that the extraction of a premolar tooth was not followed by excessive bleeding; at the same time there was a history of swollen knee-joints occurring three times and lasting some days.

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CARD SPECIMENS.

The following were the card specimens: Mr. Donaldson, Microscopic Specimens of Alveolar Sarcoma of the Cornea. Mr. Marcus Dunn, Symmetrical Spontaneous Dislocation of Both Lenses. Mr. Morton, (1) Tumor of the Right Malar Region, Probably Sebaceous; (2) Persistent Hyaloid Artery.—*Ophthalmic Review.*

SELECTIONS.

SOME EXCEPTIONAL FEATURES IN CATARACT EXTRACTION.

BY SWAN M. BURNETT, M.D., PH.D., WASHINGTON, D. C.,

Professor of Ophthalmology and Otology in Georgetown University; Director of the Eye and Ear Clinic at the Central Dispensary and Emergency Hospital; Ophthalmic Surgeon to the Children's and to Providence Hospital, Washington, D. C.

Thanks to a perfected technique and aseptic conditions, the history of a cataract extraction has become, like that of happy nations, monotonously dull. A slight iritis, an occasional tardiness in healing, confinement in bed for one day or three at most, to the room for a week, and to the house for ten days or two weeks, is, in the general run of cases, all there is to record. Only in about 10 or 12 per cent. of cases are there more serious complications to chronicle, and in from 0.5 to 5 per cent. $V=O$ is appended as finishing the history of the case.

And yet it can not be said that the operation of cataract extraction is perfected, and that nothing more remains to be done. That in a certain percentage only of cases vision is made $\frac{5}{v}$, is not sufficient to satisfy the demands of science; it requires, moreover, that " $V=O$ " be eliminated.

Again, a large number of operators—principally of the German school—still insist that a mutilation of the iris is necessary to the surest success. The capsule of the lens remains always as a possible cause of future trouble, and in at least 50 per cent. of the cases the occasion of a secondary operation

with its attendant risks, if the most nearly perfect results are to be attained.

The ideal operation for cataract is an extraction of the lens in its capsule without loss of vitreous through an intact pupil.

The presence of the capsule in the eye after the removal of the opaque lens is a more potent factor in post-operative troubles than its simple structure would indicate as possible. In fact, we would be safe in referring 90 per cent. of the inflammatory troubles, in the iris particularly, which occur after operation, to the capsule. In the first place, it is almost impossible to entirely empty the capsule of soft lens substance. The remaining corticalis swells, falls into the anterior chamber, except perhaps in some cases, where peripheral capsulotomy is done, and becomes a source of irritation. Bits of the transparent capsule may get into the wound and retard healing, thus making possible the entrance of germs to the interior of the eye. That the presence of the capsule plays a more important part in the production of post-operative inflammation than incarceration of the iris in the wound, is shown by the fact that in those cases where the lens comes out in the capsule with a loss of vitreous, and where there is almost of necessity a mass of iris left in the wound, the healing, as a rule, takes place with but little inflammatory re-action.

I will not here go into a discussion of the merits of the "simple" and "combined" operation. The choice between the two has come now to be a matter of judgment for each individual operator, and the confidence he has in his skill for the particular operation. For my own part, I have done the simple operation without iridectomy ever since the introduction of cocaine. I never voluntarily made an iridectomy in any case. If the iris is difficult to replace (which I usually effect by rubbing with the upper lid), or if it shows a tendency to prolapse, I make the iridectomy after the expulsion of the lens, which is as easy then as before its delivery. The size of the cataract I have found no obstacle in extraction through an intact pupil. A large amount of soft corticalis would lead me, if anything would, to an iridectomy.

Extraction of the lens in its capsules has been followed, I believe, as a fixed practice, by only one operator—Pagenstecher, of Wiesbaden. Others have given it a tentative trial, but finally abandoned it.

As a matter of necessity, we must, on occasion, however, take the lens away in its capsule if we are to extract it at all. This is notably the case where the lens is dislocated, either wholly or partially. Even where the lens is floating in the posterior chamber, it is possible to extract it successfully without the loss of much vitreous. Two such cases I have reported in a paper published in Knapp's *Archives of Ophthalmology*.¹

There are other indications also for an attempt to extract in the capsule and through an intact pupil. Those I shall refer to now particularly are evident thickening and toughness of the capsule, and almost all forms of degenerated cataract.

In the latter, there is almost invariably a fluidity of the vitreous, and it is much easier to handle this with an intact iris than when an iridectomy is made; and besides, in most of these cases, the zonula is very weak, if not already broken.

In some of these conditions, particularly in dislocation of the lens, it is advised, in most of the text-books, to remove the lens by means of a spoon or scoop. This is unpardonably bad surgery. *A surgeon is never justified in introducing an instrument into the eye for removal of a cataract.* A proper manipulation will succeed in delivering a lens in every case where delivery is possible. The introduction of a scoop or any other instrument into the eye only increases the dangers, both present and prospective.

It has been my exceptional good fortune to make lately three extractions of cataract in the capsule without the loss of any vitreous through an intact pupil, followed by perfect healing, thus realizing the ideally perfect extraction.

A short history of these cases is as follows.

CASE I.—Mr. R. W., aged 68. Right eye, he states, began to fail about two years ago. There is now a complete opacity

¹Contributions to Clinical Ophthalmology.—Knapp's Archives, Nos. 2 and 3, 1892.

of the lens in that eye; the capsule looks smooth, but the lens is evidently hard. Anterior chamber deep, pupil normal, and responds well to light. Tension normal. Extraction on April 13, 1895. In making the incision, I noticed some movement on the part of the lens, and this was further apparent when I came to make the capsulotomy. The capsule was tough, and the whole lens yielded to the pressure of the cystotome. I knew from this that I had to deal with a ruptured zonula, and and resolved to extract in the capsule. I told my assistant, who was holding the upper lid (I never use a speculum), to be prepared to drop the lid as soon as the lens was delivered, expecting a gush of vitreous to follow its exit. The fixation forceps were removed, and with the back of the spoon alone I made gentle pressure backwards and upwards, while the patient looked strongly downward. The lens soon became engaged in the pupil and wound. The spoon was then made to follow, with gradually decreasing pressure, the lens as it passed out of the wound, and as soon as it was delivered the upper lid was dropped. Not a drop of vitreous escaped. When the eye was opened a few seconds later, it was found that the iris has returned almost entirely, and a little gentle rubbing of the lids was sufficient to make its re-entrance complete, with a round and perfectly black pupil. The wound was nicely coapted. As there is nothing left to guard the vitreous but the delicate hyaloid membrane, I deem it wise to be unusually careful of such cases for the forty-eight hours. I enjoin perfect quiet, and use Ring's mask as a protector, to be constantly worn for the first three days and at night for a week or more. I am satisfied that many prolapses of the iris are due to self-inflicted traumatism on the part of the patient. The patient left the bed on the second day, and resumed it thereafter only for sleep at night. There was absolutely no pain, and nothing more than a slight hyperæmia of the iris, due to the stretching. On the fourth day, the pupil responded promptly to atropine, and the convalescence was uninterrupted. Already on the 29th, with $+10 \text{ s.} + 3.180 \text{ V.} = ^5/\text{XVIII.}$ The corneal astigmatism was 5.5 D., and, as is always the case after cataract oper-

ation, contrary to the rule. When the corneal astigmatism comes down to its normal degree, as it will in the course of three months, his vision will undoubtedly be $\frac{5}{v}$.

CASE II.—M. K., a colored woman, aged 55, had lost the right eye from some inflammatory trouble, which left an almost total leucoma of the cornea, many years ago. She reported, when admitted to my clinic at the Emergency Hospital on April 26, 1895, that the left eye had begun to fail only two or three years ago. This, however, seems impossible, for the cataract which was present in that eye was evidently old, or at least showed such degeneration as we seldom find except in very hypermature cataracts. The lens was evidently shrunken, and the capsule was thrown into quite prominent folds, radiating from the center. The anterior chamber was deep and the iris was slightly tremulous. The pupil responded well to light, and the projection was fair. The indications for extraction in the capsule were here imperative, and accordingly I determined to attempt its removal in the manner I have indicated in the paper before referred to. The lid being held by an assistant, the conjunctiva is grasped by the fixation forceps at some little distance behind the lower corneal margin, and as soon as the counter-puncture is effected considerable pressure is made with the forceps backward and towards the center of the eyeball. As the section progresses upwards this pressure is continued or increased slightly in order to tilt the lens forwards against the iris and hold it there. When the section is completed, the lens should be engaged in the pupil, and an increase of the same pressure is sufficient to deliver it. In this case, the lens, being somewhat shrunken and apparently totally detached at its upper portion, came promptly against the iris under the backward pressure with the forceps, and bulged it forward so that the knife, as it passed upward, cut a slice out of the iris about midway between the sphincter and the base. When the section was completed the lens had already entered the pupil, and a gentle increase of pressure caused it to pass through and out of the wound, the pressure being lightened gradually as the lens was slowly extruded. There was no

escape of vitreous, and a little gentle rubbing with the lid reduced the prolapsed iris. The wound coapted nicely. On opening the eye on the third day, a complete healing was found, and there was nothing to retard the progress of a perfect convalescence. On examination with the ophthalmoscope, an extensive choroiditis was discovered, which made anything like good vision impossible, but she was able to get about alone and wait upon herself, which was an immense gain over helpless blindness. This choroiditis probably explains the origin and character of the cataract. The inflammation of the uveal tract led to malnutrition of the lens and its subsequent degeneration. There is usually also, in such cases, a fluidity of the vitreous which makes the absence of its prolapse in this case the more remarkable.

CASE III.—B. A., a colored woman, 60 years of age, was admitted to my clinic October 1, 1894, with complete cataract of the left eye. There was no satisfactory history of the case, nor were we able to find out how long the cataract had existed. The lens was milk-white, which was suspicious of *cataracta Morgagni*, but there was no other appearance of degeneration. The iris was not tremulous, nor was there other evidence of a ruptured zonula or displacement of the lens. In making the section, however, it became evident that the zonula was weak, and on completion a slight pressure was sufficient to deliver the lens in its capsule through the intact pupil. No vitreous escaped. It was seen then that the capsule contained a very small nucleus and a large quantity of fluid. It rolled about in the palm of the hand like a globule of mercury. The iris returned without difficulty, and the healing went on without accident as in the other cases, and the ultimate vision was good. Illiteracy of the patient prevented a thorough testing of visual acuteness.

These cases show the brilliant side of cataract extraction whose art seems to have triumphed completely over nature, but there is, alas! another side which shows how futile may become our best endeavors, and which should impress upon us

the fact that the last word has not yet been said in regard to the management of this most important operation.

That an operation has been smoothly performed and under the most approved modern aseptic conditions, is not an absolute guarantee that all will go well. That suppurations are rare—much rarer than before the introduction of aseptic methods—is true; but we have not, for all that, entirely abolished the possibility of infection. The danger does not seem to be passed when we have an apparently perfect healing of the wound, and the question of auto-infection is not by any means settled one way or the other. Of course, in the vast majority of cases, when the third or fourth day has passed without any serious symptoms, and the wound seems well coapted; we consider that we are “out of the woods,” and are possessed of a sense of security as to the final issue. But occasionally we have an experience which shatters our faith in our assumed accurate knowledge of all the conditions attending the course of healing and renders our humiliation extreme. The following is such an instance:

CASE IV.—W. T., white, aged 68. Had been operated on by me at Providence Hospital six years ago for cataract of the left eye with a good result—in spite of an incarceration of the iris in the wound due, undoubtedly, to his restlessness. He was a very bad subject, and hard to control. When admitted to my clinic at the Emergency Hospital on April 2, 1895, the cataract in the right eye was ripe, the pupil good, with all the indications for a successful operation. In spite of his want of control of himself, the operation was completed without any accident. The soft corticalis was removed without any difficulty and the iris re-entered promptly, leaving a black round pupil. On the fourth day a moderate iritis set in. The lips of the wound seemed well coapted, but the anterior chamber was still shallow, indicating that there was a portion of the incision which had not entirely healed. The anterior chamber was restored in about a week, and in ten days the iritis had had subdued, leaving three or four slight synechiæ. At the end of the sixteenth day after the operation, he was discharged.

There was at that time no pain and but a slight injection of the conjunctiva around the base of the cornea. A week after his discharge, he returned with the pupil and the lower third of the anterior chamber filled with pus, the edges of the wound yellow, very pronounced chemosis of the conjunctiva; and much pain. He stated that this condition had developed suddenly two days before—that is, three weeks after the operation. He knew no cause for it, he persisted in averring, and stated he had simply stayed quietly around the house. His general unreliability leads us to doubt this, and the probabilities are that he engaged in excesses of some kind. He was taken back to the hospital and treated rigorously. The edges of the wound were cauterized with formaline of half strength and a weaker solution (1 to 1000) used as a cleanser every three hours. Nevertheless, the cornea slowly melted away and a panophthalmitis set up, which ended in an abscess, which perforated behind the cornea on the outer side. The stump was removed as soon as the acute symptoms had subsided. On opening the eye after enucleation, it was found filled with pus. The healing was prompt, and he was discharged a week later.

This is the second eye I have lost from panophthalmitis after cataract extraction since the introduction of strict asepsis. The first one, however, could be referred to a removal of the bandage by the patient the first night after the operation, which gave opportunity for infection, and which promptly showed its effects on the second day. But this second one is exceptional in my own experience, and my researches fail to show any other (though, of course, there may be such on record), in which so long a time as three weeks has elapsed before suppuration showed itself. In the pre-aseptic days, I had one case in which suppuration occurred a week after the operation; and after the patient was up and about. In this instance, it followed an exposure to cold in severe weather in an unwarmed water closet.

When, then, can we consider ourselves absolutely safe after cataract operation? Wherein is the danger, and where does the enemy hide himself? It is certain that the germs got

into the eye from some quarter. Did they enter at the time of the operation and remain quiet for three weeks? Did they get in through some open space in the wound which had not healed promptly, or were they carried by the circulation? But whatever may be the explanation, the lesson we are to learn is that our precautions before, during, and after the operation, are to be increased in vigor if we are to eliminate completely the danger of suppuration after cataract extraction.—*Virginia Medical Monthly*.

A SIMPLE AND EFFECTIVE METHOD OF TREATMENT IN PURULENT CONJUNCTIVITIS OF INFANTS.

Twenty-five years of eye-practice, private, and in hospital, has given me abundant opportunity to test the relative merits of the different methods of treatment in suppurative conjunctivitis of infants.

Until about one year ago it was my belief that nitrate of silver, when properly applied, was the most reliable of all medicines in this dangerous disease. In my hands, as well as in those of my professional brethren with whom I am intimately acquainted, it has never failed to cure, if begun before ulceration of the cornea has taken place.

To *properly apply it* does not mean to drop it into the eye, one or more times daily, as it would by such a method be too irritating, if used of sufficient strength to control the suppurative process. It must be applied with a camel's hair pencil to the thoroughly everted palpebral and reflected portion of the conjunctiva, and then washed off, without suffering it to come in contact with the cornea, as strong as 10 to 40 grains to the ounce of water, according to the gravity of the case, or the profuseness of the discharge.

How many physicians are there who can properly evert the lids of a newly born infant? This question can only be answered by those who have tried it. To carry out this method

of treatment until the case is cured, it is necessary that the physician make the application himself, once in every twenty-four hours. It dare not be given over to a nurse or parent, and it has to be kept up from two to six weeks.

Let us compare the above difficult but almost certain method to a more simple and easily practiced one, which was introduced by Dr. X. C. Scott, of Cleveland, who presented it to the American Medical Association at its last annual meeting. It is as follows:

Hydrastia sulph.,					
Acid boric,					
Sodii bi-borat.,	-	-	-	-	āā grs. v.
Tinct. opii deod.,	-	-	-	-	ʒss.
Aquæ dest.,	-	-	-	-	ʒj.

Mix and filter.

Dr. Scott has the eye cleansed every twenty minutes and cold compresses applied when required. He then has the above solution injected into the upper and lower conjunctival sacs, about six times a day, by means of a medicine dropper with a nozzle long, smooth, and strong enough to be easily introduced beneath the upper lid without breaking. Once a day he used, in addition to this, a one per cent. solution of silver nitrate to the inner surface of the lids. (*He tells me that he does not use the silver now*).

It will be seen by those who have read the discussion which followed his paper, that nearly all of the gentlemen present gave all of the credit to the silver treatment. They seemed to ignore the fact that the cases got well in about one-fifth of the time usual to the silver treatment alone. It was my fortune to hear from Dr. Scott's own lips all about this method several months before he read the paper to the Society. I tried it on a case a few days afterward. It was a very severe one occurring in both eyes, one of which had ulceration of the cornea. I gave a very grave prognosis. A twenty-grain solution of silver was applied to the everted conjunctivæ and the yellow root solution was given to the nurse, to be dropped into the eyes every hour afterward. On visiting the hospital the

next day I was surprised to find that the discharge of pus had nearly ceased. I therefore simply had the yellow collyrium used every hour, for a few days, and in ten days the child was cured, except the ulcer, which at this date is well and only a small opacity remains.

I have treated several very bad cases since then; all of them were cured inside of two weeks. All that seems to be necessary is to inject it under the lids every hour, cleanse the eyes still more often with tepid water and use every night a little vaselin on the edges of the lids. They should be watched by the physician to see that nothing goes wrong, and he should be sure to see that ulceration of the cornea did not exist before the treatment was begun.

A greater boon never was given to the busy physician than this one of Dr. Scott. It will save many a child from blindness.

J. L. THOMPSON, M.D.

EPHEDRIN-HOMATROPINE, THE NEW MYDRIATIC.

A REVIEW OF THE WORK OF DR. GROENOUW AND
DR. GEPPERT.

BY GEORGE F. SUKER, M.D., TOLEDO, OHIO.

Though a long-continued mydriasis is of great therapeutical value in many cases, it is nevertheless very inconvenient if a mydriasis is wanted only for diagnostic purposes. An ideal mydriatic for diagnostic purposes would be one that would produce a maximum pupillary dilatation with the minimum disturbance of vision. Cocaine and homatropine produce a rapid as well as a maximum dilatation; their effects, however, continue too long, often taking twenty-four to thirty hours before the same are worn off. Now this ephedrin-homatropine solution seems to fulfill the requirements as far as an ideal diagnostic mydriatic is concerned. It produces a rather rapid dilatation, though not maximal, and its effects pass off within an hour or two.

Professor Geppert has experimentally proved this on several animals, of which experiments the following is a *résumé*: A ten per cent. solution of ephedrin when instilled into the conjunctival sac of a rabbit produces within one half to one hour a moderate dilatation of the pupil. In diffused daylight the pupil is as large as the one resulting from atropine. On being exposed to a bright light the pupil contracts to about four to five millimeters; while the one to which the ephedrin has not been applied contracts down to one to two millimeters in diameter. If the ephedrin is instilled directly into the anterior chamber the mydriasis follows within a few moments. The maximum dilatation lasts only about half an hour; from then on the effect gradually wears off, and within a few hours entirely disappears. There is no apparent action when the ephedrin is applied to cats' eyes; in dogs it acts irregularly, in so far as it sometimes produces an early dilatation, and, on the other hand, sometimes requires several hours.

The effect of ephedrin is greatly increased by the addition of a small quantity of homatropine—*e. g.*, a ten per cent. solution of ephedrin to which has been added 0.1 per cent. solution of homatropine is more powerful than the ephedrin solution itself. In all cases in which this ephedrin-homatropine solution has been instilled there was a greater dilatation than in the simple, and the effects pass off as rapidly as from the ephedrin itself.

The following formula gives the proportion in which it has been extensively used both for experimental and clinical purposes:

Ephedrin,	-	-	-	-	-	-	-	1.00
Homatropine hydrochlor.,	-	-	-	-	-	-	-	0.01
Aq. dist.,	-	-	-	-	-	-	-	10.00

This solution is perfectly clear and colorless. If applied to the eye of a patient it may possibly produce a slight smarting similar to the homatropine irritation, yet in the majority of cases no such complaint is made. In one hundred cases no irritation or untoward effect of any kind was noticed.

The ephedrin-homatropine solution does not influence the

accommodation in the least, for in each case the near point remained normal, as was determined by the reading of very small test type. Though the mydriatic action is quite rapid and powerful, still the pupil never entirely fails to react toward light.

After a single application of this combined solution to the eye the pupil begins to dilate on an average within eight minutes and a half (varying from six to thirteen minutes), and attains its maximum dilatation within half an hour; the average being thirty-four minutes. Within an hour after the application the pupil slowly begins to contract, and after the lapse of from four to six hours has again attained its normal size. The greatest dilatation continues for about half an hour, varying from fifteen to forty-five minutes, the average being twenty-nine minutes. At the maximum dilatation the pupillary diameter measures from five to six millimeters (average, 4.5 to seven millimeters), which is sufficiently large for diagnostic purposes.

The diameter of the pupil was taken in each case as strong light fell upon the macula lutea. If the light impinges upon more or less peripheral parts of the retina and not upon the macula lutea, the diameter of the pupil reaches as high as nine millimeters, and sometimes even more. The effects of the ephedrin were considered as passed off when, upon the egress of rather intense light, the pupil contracted down to its normal size. Certain it is that even when the eye was subjected to a very moderate light the pupil was a trifle larger than an eye not treated with the above-given solution. For this reason the period of time which it takes for the effects to entirely wear off vary considerably. For instance, de Vriere found a return to the normal width all the way in from five to six hours, Groenouw, as early as four hours after the instillation of a ten per cent. ephedrin solution.

In the use of a solution of five per cent. ephedrin and 0.05 per cent. homatropine this action was much slower, and caused no irritation, as sometimes the stronger solutions do. With this strength the pupil began to dilate as early as with a ten per cent. solution—*i. e.*, eight minutes and a half after the first

application—and a full mydriasis was obtained within forty minutes. The return to the normal width began a trifle sooner, usually after fifty-six minutes, while the entire influence had passed off after a lapse of three hours and a half. The maximum dilatation continued for twenty minutes, and this dilatation is as great, as experiments have shown, as that resulting from the use of a ten per cent. solution.

In the use of a one per cent. homatropine solution the mydriasis takes place much later than by the use of the combined solution—*i. e.*, fourteen minutes—and attains its maximum much later, and continues for about twenty-four hours.

The ten per cent. solution of ephedrin does not show any marked difference from the combined solution—*i. e.*, no difference with reference to the beginning of mydriasis, its maximum point, and the time necessary for the return to a normal condition. The greatest difference between the two solutions exists in maximum dilatation. By the use of the combined solution the pupil is dilated from one to two millimeters more than by the ephedrin solution; hence the mydriatic power of the ephedrin is greatly increased by a trifle of homatropine. Then, too, the combined solution of ephedrin and homatropine does not deteriorate as rapidly as homatropine, a solution of the former three months old showing no sign of loss of action.

The curve for the ephedrin-homatropine solution is rather rapid in rising, a somewhat short climax, and a gradual decrease to the normal. The curve for the ephedrin is similar to the above, with the exception of not attaining so high a climax. The curve for the homatropine begins to rise somewhat later, but in a similar manner, while the combined solution reaches a trifle higher point and remains there for a longer period of time.

From the above remarks it can be seen that we possess in the ephedrin-homatropine solution practically an ideal mydriatic for diagnostic purposes, being rapid in its action, sufficiently intense, and of very short duration.¹—*New York Medical Journal*.

¹Merck prepares this solution under the name of "mydrin."

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ORIGINAL ARTICLES.

NEURITIS OPTICA DESCENDENS CONSEQUENT UPON NASAL TREATMENT.

BY ADOLF ALT, M.D., ST. LOUIS.

The readers of this journal will find in the June number of 1887 the translation of part of an article by Ziem, published originally in *Hirschberg's Centralblatt*, in which the author relates some cases, in which the use of the galvano-cautery in the nose had evidently induced some impairment of vision. In his experience this impairment of vision was combined with a venous pulsation on the papilla of the affected eye, general venous hyperæmia of the retina and, in one case, with an increase of the intra-ocular tension.

Ziem saw the cause of these ocular phenomena in the numerous anastomoses between the blood-vessels of the nasal cavity and of the orbit and eyeball (particularly the ethmoid-ales). He thought that the blood, which by means of the galvano-cautery is suddenly driven from the nasal tissues, escapes into the orbit and the eyeball, and there produces a hyperæmia,

which more particularly affects the erectile tissue of the ciliary body.

In an article on rarer forms of injury to the eye, published in the *Archives of Ophthalmology*, 1887, Berger relates a case in which the bunglingly performed galvano-cautery of the erectile tissue in the nose was followed by necrosis of the nasal bone, and by impaired vision, as if a thick mist was lying before the eye. He saw the patient when vision had almost returned to the normal. He found a normal fundus, but the field of vision in the affected right eye, was still concentrically narrower to from 10° to 15° , than in the fellow eye, and 5° more to the temporal side.

In his opinion the eye affection was due to an irritation of the trigeminus nerve and must be considered as a reflex amblyopia.

The only text-book which mentions anything on the subject, is, as far as I can find, that on the relations between the eye and its diseases to the diseases of the body and its organs, by M. Knies. Knies in referring to those cases says:

"More importance attaches to the cases of impaired vision following operative measures to the nasal mucous membrane (galvano-cautery), as reported by several authors. It seems, that in such cases we have not infrequently to deal with the well known concentric contraction of the visual field with or without impairment of central vision and of color perception. The eye, corresponding to the side operated upon, is the only one or at least the one most impaired, and in all cases the affection is a transient one. All other pains or painful interferences in the neighborhood of the eye may occasionally act in a similar manner."

It seems then, (and I have seen two such cases, in my practice), that galvano-cautery applied to the nasal mucous membrane may produce a reflex amblyopia with narrowing of the field of vision, or an impairment of vision combined with or due to a hyperæmia of the eyeball, especially of the ciliary body.

The following case, which has just passed under my own

observation is of a somewhat different and undoubtedly more serious nature.

E. J. L., 38 years of age, consulted me September 7, with the following history: He had been treated for nasal catarrh and narrowing of the left nasal passage by means of different applications and of galvano-cautery. Two days before seeing me he noticed, that his left eye did not see as usual, but, although he mentioned this to the gentleman who treated the nose, the treatment was persisted in. When he awoke on the morning of September 7, he found his left eye to be totally blind. He came to me in great anxiety, because he could now hardly see daylight.

I found a more than medium widely dilated and scarcely moving pupil. Vision was reduced to a doubtful perception of light. The ophthalmoscope showed a papilla the outlines of which were almost invisible and a high degree of venous hyperæmia in the retina, combined with thin arteries. Tension was normal. The urine was found to be normal. Nothing pathological could be detected in other organs.

From the history as given by the patient, I did not doubt, but what this neuritis was due to the nasal treatment. I, therefore, advised a complete cessation of all treatment.

In doing this I hoped, that a cessation of all irritating interference would be followed by a speedy disappearance of the affection of the optic nerve. In this I was not altogether disappointed. On the third day the patient counted fingers eccentrically, up and outwards, at one foot. On the sixth day the field had considerably increased on the nasal and lower sides, and fingers were counted at five feet upwards and outwards, at four feet in the other parts of the field. As this condition remained the same for a few days I began to inject strychnia. This was followed by a much more rapid increase in vision and on the eighteenth day after I had first seen him he had regained a vision of $\frac{20}{xxx} +$. The field of vision was still somewhat reduced in all directions except upwards and outwards. The veins appeared normal, but the arteries were

still thin and the papilla almost white. Color perception was normal.

In order to get a full history of the case, before I saw it, I requested Dr. H. Loeb, of this city, who had treated the nasal affection, to kindly furnish me with it, and the following is his reply:

"Mr. E. L., age 28 years, yard-master, consulted me first August 28, 1895, presenting the following symptoms: For several years he has suffered from obstruction of both sides of the nose; hawking, deafness, headache located over the frontal region. The deafness affects the left ear, the right being normal. Sense of smell is obtunded. He has had several accidents to his nose; had lues in 1889. He is accustomed to drink occasionally. Mother is still living, age 60; father died of paralysis at 49. Examination of the nose showed septum deflected to the left, with a sharp spur in the middle turbinated region, and chronic hypertrophy of both inferior turbinates. Removal of the spur and cauterization of the inferior turbinated were advised. Accordingly, on August 29, the left inferior turbinated was moderately cauterized. The following day there was some considerable swelling, not any unusual amount. The history of the following four days was the customary one. On September 2, I left the city, leaving the case in charge of my assistant, Dr. Sutton, who reported that during my absence nothing unusual occurred in the nose beyond a rather undue persistence of the swelling in the nose. Returning September 7, I found practically the condition that Dr. Sutton has described. A few days after this seemingly without any special reason the affection of the eye manifested itself, and he was accordingly referred to Dr. Alt. Subsequent examination revealed nothing unusual in the condition of the nose."

As the patient called to see me on the 7th, Dr. Loeb, in the last few sentences, evidently made a slight mistake.

From this letter, I for the first time learned the fact, that the patient had been infected with syphilis, and he now acknowledged it to me. It is, therefore, not impossible that in this case the severity of the attack was in some measure due

to the former syphilis. As however, no other symptom was present, as the eye-affection followed the nasal treatment, as it was confined to the eye corresponding to the side of the nose under treatment, and, finally—as the cessation of all nasal treatment was followed at once by a spontaneous, if at first slow, improvement—I think the syphilis can only be accused of an indirect cause in this trouble. It may have rendered the patient the more vulnerable and this may, perhaps, explain the severity of the affection.

Similar experiences should, I think, be made more widely known, as they are probably more numerous than would appear from the literature at my disposal..

SELECTIONS.

THE PATHOGENESIS OF SYMPATHETIC OPHTHALMIA.

BY LOUIS STRICKER, M.D., CINCINNATI.

No disease which presents itself to the oculist offers a more serious prognosis than sympathetic ophthalmia, for in the vast majority of cases it leads to total and incurable blindness. Rarely does the sympathizing eye escape with any useful vision. Hence this subject is an eminently practical one, because, necessarily, the treatment must be guided entirely by our conception of the pathogenesis of the disease.

Two theories have been promulgated, one that sympathetic ophthalmia is a neurosis, the other, that it is an infection; and finally, in 1892, a theory was set up stating that primarily it is a neurosis, the irritation creating a soil on which secondarily micro-organisms circulating in the blood find conditions favorable for their further development.

Naturally, as long as pathology taught that inflammation was the result of the action of sensitive and vaso-motor nerves on the capillaries, so long the cause of the inflammation in the second eye was looked upon as the result of the transference of ciliary nerve irritation to the second eye; but with the founding of a new principle, namely, that inflammation is the result of the action of micro-organisms, at present of their ptomaines or toxic products on the vessel walls, the investigators for the cause of sympathetic ophthalmia were forced to follow similar lines. However, notwithstanding the fact that for a number of years this disease was looked upon as the result of an infec-

tion, the student of the literature of the subject will find that many voices were again raised in favor of the ciliary nerve theory, and Deutschman's theory found but few champions at the Heidelberger Congress of 1891 and 1892. Since then more convincing proof has been published, which tends to strengthen the mycotic theory. Reasoning by analogy, who to-day would doubt that syphilis or acute articular rheumatism are of microbic origin, or who to-day believes that an irregular incision made during a cataract extraction or the cicatrization of the iris will lead to sympathetic ophthalmia?

Schirmer¹ says: "The fact that inoculations of pieces of tissue taken from sympathetic eyes did not cause inflammation does not prove that bacteria were wanting, for rabbits are exceedingly refractory to the action of micro-organisms. Further, is it not possible that our methods are not sufficiently developed to prove their presence? It is illogical to doubt the bacterial nature of this disease, because we have not as yet proven a specific microbe. The many negative results simply indicate the difficulties in the way of acquiring a positive result."

As early as 1844 Mackenzie² developed three modes of transference of the disease from the one eye to the other:

1. *The propagation by means of the blood-vessels along the base of the brain.* He supposed that the vessels of the diseased eye, being in a state of congestion, this same condition was possibly transmitted to the vessels of the other side, with which they stood in connection by means of the circle of Willis.

2. By means of the ciliary nerves, being transferred by the third and fifth pair to the brain, here reflected to the opposite side and thence down to the second eye.

3. By direct propagation of the disease from the retina and optic nerve to the chiasm and then down the second optic nerve to the other eye. He considered the optic nerves as the principal means of transference.

In 1849 Mooren quotes Taignot as stating that the primary trouble is a ciliary neurosis.

In 1858 Heinrich Müller³ acknowledged the possibility of transference along the optic nerves, but since he frequently found the nerve atrophic, hence impossible of carrying impulses, he held it improbable; but, since he found that the ciliary nerves were but partially atrophic, some simply denuded of their myelin sheaths, he assumed that they were the carriers of the sympathetic process.

In 1862 Pagenstecher⁴ denied the involvement of the optic nerves, and claimed that the transference was entirely due to the ciliary nerves, more especially the nutritive sympathetic fibres.

From now on opinions all began to coincide with the ciliary nerve theory, until finally, in 1881, Ludwig Mauthner⁵ reviewed all the opinions and investigations which had been made up to that time. He was a staunch adherent of the ciliary nerve theory. He divided his cases into two classes, the traumatic and the non-traumatic. The non-traumatic he again divided into two classes:

1. *Those which result from the irritation of the uveal tract*, as per luxated lens, or intra-ocular cysts or tumors. He states, however, that all may have been preceded by a trauma.

2. *Those which result from pure uveal disease*, idiopathic cases of cyclitis or irido-choroiditis. Here, again, he adds that it is not an easy matter to determine whether the affection of the second eye is not the result of a general disease, as per example, syphilis or secondary to cerebro-spinal meningitis.

Hence, even he casts a doubt on all the non-traumatic cases. *The traumatic* he divides into the *operative* and the *accidental*, and he further admits that sympathetic disease may follow without involvement of the ciliary body.

He discusses two views at length. First, that the disease is propagated along the optic nerve apparatus, but since operation had proven time and again that in the second eye the anterior half of the globe is involved, the cause was sought in the ciliary nerves, some believing that the irritation is carried along the optic nerve, but in the sympathizing eye is transferred to the ciliary nerves, thus leading to the inflammation;

whereas, others believed that the irritation is carried from the ciliary nerves to the brain, reflected to the other side, and, thus *directly*, by means of the ciliary nerves of the second eye, hence to a true ciliary neurosis.

Mauthner concludes that both the optic nerves and ciliary nerves may be the means of transference, the optic nerves propagating irritants and inflammatory conditions from the retina and optic nerve, whereas the ciliary nerves propagate similar conditions, which originate in the parts of the eye supplied by the ciliary nerves. "There can be no doubt but that both modes of transference frequently occur at the same time, so that some symptoms may be ascribed to uveitis, others to neuro-retinitis."

However, the year previously to the publication of Mauthner's work, MacGillivray, at the International Congress held at Amsterdam, 1880, reported a case of sympathetic ophthalmia in which the microscopical examination of the enucleated eye, its optic nerve end sheath, disclosed conglomerations of cells between the pial and dural sheaths of the optic nerves. He stated the possibility of similar groups of cells in the lymph space within the cranial cavity, and also suggested the possibility of the inflammation being carried along this space surrounding the optic nerve.

The same year Berlin⁶ stated that sympathetic ophthalmia (irido-choroiditis) is metastatic and infectious in its nature, the products of the infection being taken up by the general circulation, reach the second eye, where, finding similar conditions, they again become active.

During the same year Leber⁷ expressed the hope that experience would yet prove the truth of the general proposition "that true sympathetic inflammation is an infection the result of a septic inflammation of the first eye." He emphatically insists on a separation between sympathetic neurosis and sympathetic inflammation. The same year at the International Congress, held in London, Snellen⁸ spoke against the ciliary nerve theory, and came to the following conclusions:

1. That the ciliary nerve theory is wanting in even a single convincing proof.

2. That the disease is a specific form of septic choroiditis.

3. That in all probability the lymph space surrounding the optic nerve is the path along which the infection travels from one eye to the other.

In the meanwhile Deutschman had been carrying on his experimental investigations, his first publications appearing in *Graefe's Archiv.*, Vol. xxvii, Bd. 1, 1882 ("Experimentelle Erzeugung Sympathischer Ophthalmie"), and others followed in rapid succession in Vol. xxix, Bd. 4, 1883, and Vol. xxx, Bd. 3, 1884. All of which he again compiled in a monograph on the subject,⁹ in which he critically analyzed all the literature on the subject. Stated as briefly as possible:

1. Injections of the spores of the *aspergillus fumigatus* into the eyes of rabbits produced an inflammation of the second eye. He noted not only an optic neuritis, but an inflammation of the entire uveal tract. Believing this to be *the result of a chemical irritant* derived from the mould, he injected cotton oil and got a positive result.

Anatomical pathological examination showed a purulent inflammation of the affected eye, especially of the papilla, and it seemed to extend into the nerve and along its sheath and lymph space surrounding the nerve, from here to the chiasm, and then to a less degree it descended to the second eye, gradually increasing the intensity as it approached. *From this condition he concluded that the sub-vaginal lymph-space served as a path for the spread of the inflammation.*

2. He next made injections of pure cultures of the *staphylococcus aureus* and *albus* into the vitreous of the eyes of rabbits, which produced a chronic irido-cyclitis or choroiditis, ending in phthisis bulbi, followed in from five to six days by a beginning inflammation of the papilla of the second eye, when, without showing any signs of meningitis, the animals grew weak, emaciated, and died of *general sepsis*, without the development of iritis or cyclitis on the second eye. Inoculations of a few drops of the blood of these animals on culture media de-

veloped pure cultures of the staphylococci, which further injected into animals proved exceedingly virulent.

3. In order to shorten the time until the disease should develop, he made injections into the nerve sheath close to the optic foramen, and on the following day the papilla on the same side was inflamed, and on the day following the vitreous was diffusely infiltrated and iritis began to develop. Hence he assumed that the micro-organisms had descended along the lymph space surrounding the nerve, and thus caused the inflammation of the uveal tract. Microscopical examination showed the presence of staphylococci also extended toward the chiasm, and these would eventually have reached the second eye. *This lymph stream in the pial sheath is directed toward the globe, away from the brain, hence the microbes must work their way against the lymph stream up to the chiasm, from whence they are carried down to the second eye by the lymph stream.*

There being no anatomical difference between the optic nerve apparatus in man and animals, he concluded that the transference of the infection must proceed in the same manner in man. All that remained was to prove the truth of this hypothesis by the pathological examination of human eyes. In doing this he sought for three proofs or conditions:

1. Did eyes enucleated for existing or threatening sympathetic ophthalmia contain microbes?
2. Did a neuritis or peri-neuritis exist?
3. Were the germs pathogenic, and did the second eye contain pathogenic germs?

In an examination of twenty cases,¹⁰ all except one showed the presence of micro-organisms, and in most of them they could also be demonstrated in the sub-vaginal lymph space. A papillitis was either present or evidences of the same were to be recognized.

The next link in the chain was to prove that the germs were pathogenic. In a series of nine cases, under the strictest antiseptic precautions, the eyes were opened immediately after enucleation, and inoculations of pus taken from the vitreous

were made on culture media. Every one of them showed the characteristic Rosenbach staphylococcus pyogenes aureus and albus. In five succeeding cases he not only carried out this procedure, but he drew off the aqueous from the second affected eye, inoculated this on culture media, and the growth of the micro-organisms showed the characteristics of those taken from the first eye. All showed, though somewhat attenuated, the characteristics of the staphylococcus pyogenes aureus and albus. The chain of evidence being complete, he concluded that *the pathogenic germs give rise to the inflammation, which travels along the lymph space to the second eye.*

These experiments mark an epoch, and changed the whole theory as to the cause of this affection.

These experimental investigations were taken up at the time by Alt,¹¹ of St. Louis, who, after a number of experiments with a 3 per cent. infusion of the abrus precatorius, succeeded in producing a sympathetic inflammation, and concluded that it must have gone along the lymph space to the second eye.

Gifford,¹² in 1886, did not have a single success in twenty-one cases in which he used the staphylococcus, but he succeeded in three out of four cases in which he used the tetanus bacillus. He was a great opponent of the sub-vaginal lymph-space theory, and states that the infection was neither carried along the optic nerve or its sheath, but along the central canal of the vitreous to the large blood-vessels of the optic nerve, thus getting entirely outside of the dural sheath, is carried by the lymphatics which surround the vessels through the sphenoidal fissure, until reaching the cranial cavity, from where, again, getting into the dural space and thus reaching the lymph space of the second eye.

Mazza,¹³ in 1887, concludes that the micro-organisms are only found in the second eye in consequence of meningitis.

But neither Deutschman, Mazza nor Gifford succeeded in their numerous experiments in proving this migration without a general infection setting in.

Parisotti¹⁴ succeeded in producing an infection of the second eye in eight out of thirty cases; of these, three died of a

general infection. In his five remaining cases the swelling of the papilla disappeared after a few days, and he is not inclined to look upon the staphylococci which he found in the chiasm, and even in the optic nerve of the second eye, as the cause of the inflammation, as he believes that they had lost their pathogenic qualities.

Both Limbourg and Levy¹⁵ and Angelucci¹⁶ have succeeded in raising pathogenic cocci from the aqueous and pieces of excised iris taken from the second eye; the objection has nevertheless been raised that as long as the experiments can not be successfully carried out on animals the success of all these experiments might be the result of an invasion of the cultures by microbes, an objection which was raised by Randolph¹⁷ and Greef,¹⁸ and all those who favor a nervous origin. This argument has received support in consequence of the negative results of others.

Schirmer,¹⁹ however, notwithstanding a negative result in twelve experimental investigations, which were carried out exactly according to Deutschman's methods, expresses himself in favor of the bacteriological nature of this affection as opposed to a ciliary neuroses, giving as his reasons "(1) its exceptional power of propagation; (2) its severity and the frequency of relapses, which often occur even after an enucleation; (3) the total absence of any prodromal symptoms; (4) the short interval of three weeks having been sufficient for its development, even after an enucleation; (5) an eye must always suffer from an infectious uveal disease in order to be able to produce a second for which a mechanical irritation is not sufficient; and (6) it must not be forgotten that every evidence of a true progressive inflammation as the result of irritation of nerves is wanting."

Schirmer felt called upon to defend this theory, because voices were being raised on every hand in opposition to the bacteriological nature of the disease. For, as already stated, Schmidt-Rimpler²⁰ set up a new theory, that the ciliary nerves in the injured eye reflexly disturbed the circulation in the other eye; hence its nutrition, and thus preparing a soil for the

inflammation-producing substances which were carried to the eye by the circulation.

Deutschmann also felt called upon to defend his theory, and in a very lengthy publication²¹ he gives the results of his further investigations. He states that though in his former experiments, numbering thirty-four, he had twelve positive results, equal to 30 per cent., in the last two years in thirty-five experimental investigations he has had but two positive results. He further recites the remarkable case, which occurred in his own practice, of a man who came to him with a well-developed case of sympathetic ophthalmia subsequent to an operation made to better his vision. While under observation the man died of, presumably, a cancer of the stomach, and he obtained permission to take the entire visual apparatus—both eyes, optic nerves and chiasm—intact. As a result of his bacteriological investigations he was enabled to demonstrate the bacteria in the first eye, its optic nerve, the chiasm, the second optic nerve, the lymph space and in the second eye. This is the only case on record in which the entire tract could be examined in man, and it is certainly of great value, and gives special emphasis to the bacteriological origin of the disease.

REPORT OF A CASE.

In April, 1894, through the courtesy of Dr. C. R. Holmes, the opportunity was given me to investigate, and, if possible, prove the Deutschman theory.

Bridget T, age sixty-four, was operated at the Cincinnati Hospital for senile cataract. The extraction was made, with every possible care to asepsis and antisepsis, no mishap occurring at the time of operation. After the operation the patient was placed in a mixed ward (where patients suffering from various diseases are kept); the eye did badly, and was lost by panophthalmitis. She passed from observation, and six months later presented herself at the doctor's office with a well-developed plastic irido-cyclitis of the other eye. The iris was bound down by a ring synechia and the pupil filled with a plastic ex-

update. There was a great deal of ciliary injection, eyeball exceedingly painful and tender to the touch. The first eye likewise was inflamed, tender to the touch, totally amaurotic, and shrunken. An immediate enucleation was done on April 16, 1894, and the globe at once placed in Müller's fluid for microscopical examination. Six days later an iridectomy was made on the right eye (the second affected), the conjunctiva having previously been sterilized with a 1:1000 sublimate solution, followed by a saturated boracic acid solution. A broad incision was made with a Graefe knife and the aqueous at once aspirated from the anterior chamber with a very long, thin glass pipette (shaped like a pair of iris-forceps, and made on the same principle as the droppers in the German drop-bottles), which had previously been sterilized in steam for one-half hour, no antiseptic being taken up previously in the pipette. The drop of aqueous was at once inoculated on a tube of gelatin, and on the following day placed in a warm chamber having a constant temperature of 37.2° C. The following day a culture was made from this tube on an agar tube, but both of these tubes remained sterile at the end of four days, thus proving (1) that it is possible to draw off the aqueous from the anterior chamber without getting an infection from the conjunctiva or getting an infection of the tube direct; (2) that in this case at least Deutschman's idea of finding the germs in the aqueous of the second eye, notwithstanding a very marked sympathetic ophthalmia, was not realized.

After the iridectomy was made the eye was bandaged, but some chemosis followed, no doubt due to the use of the strong sublimate solution. The wound healed kindly, but the space of the iridectomy filled up with plastic material, and the eye has since been hopelessly lost.

The microscopical examination of the enucleated eye showed all the characteristic degenerations which follow panophthalmitis.

In the bacteriological examination specimens were stained with methyl blue and by the Gram's method, and, though fully one hundred sections were examined with the most painstaking

care, only a few of the pus-formers could be demonstrated in the interior of the eye. In one section they were found in the tissue of the ciliary body, but the section was mislaid and could not be found again. Both staphylococci and streptococci were found in the purulent exudate in the anterior chamber and vitreous; but long-continued search failed to find a single germ in the sub-vaginal lymph space. Hence, in this case micro-organisms could not be demonstrated either in the sub-vaginal lymph-space or in the aqueous of the second affected eye, two of the main factors on which this theory rests.

As long ago as 1840 Von Graefe made the emphatic statement that "where an eye is lost by suppuration this is not to be looked upon as a misfortune, since sympathetic ophthalmia of the second eye has never been observed where the first had been lost by suppuration." Panophthalmitis is the severest form of infection, and it was supposed that the severity of the inflammation blocked up all the channels of exit, and held the germs within the eyeball. True, panophthalmitis rarely leads to sympathetic ophthalmia, *but it can do so*. The cases on record are not a few in which, years after an apparently successful operation, the operated eye suddenly became inflamed, underwent a chronic inflammation, and in course of time sympathetic disease of the second eye followed.

As long ago as 1878 Leber²² showed that where the iris, ciliary body, or even the capsule of the lens, cicatrize in the wound they give rise to slight differences in niveau, the formation of slight nodules, the epithelial covering of these is very apt to be stripped off.

Now, should a microbe infection occur, the condition is produced which leads to inflammation. This has been conclusively proven by the further investigations of Wagenmann,²³ who has shown that microbes gain entrance along fistulous tracts years after an apparently successful operation. For this very reason the operations of iridodesis, tattooing and drainage were abandoned. The evil results which followed reclination and discission were largely due to the use of non-sterile instruments. The same may be said of the operations for cataract

and iridectomies. One must not forget the fact that the infection can also be carried from an infected conjunctiva or non-surgically clean dressings. It is certainly a deplorable condition where both eyes are lost at the same time, but to the surgeon it surely must be more deplorable to lose the second eye as the result of an injury of the first, especially when an operation done on the first to save this not only fails, but in the course of time involves the second.

As long ago as 1856 Von Graefe reported four cases of sympathetic ophthalmia following reclinatio. This fact eventually brought the operation into disrepute, and led to the flap operation, and this, in its turn, to the linear extraction. Becker²⁴ considered this of such great importance that he devoted a separate chapter to its discussion. He critically analyzed some twenty-two cases, and finally concluded that the tension of the cicatricial bands on the ciliary body led to chronic irritation and sympathetic ophthalmia. Many of these earlier experiences read in the light of our present understanding of the subject are clearly an infection.

Formerly it was supposed that tumors could give rise to sympathetic ophthalmia. Here, evidently, there must have taken place either previously or subsequent to the formation of the tumor a perforation, thus opening the door for an infection. Dr. Nieden,²⁵ of Bochum, reported a case of sympathetic ophthalmia in a young lady of twenty one years. She had been seen some time previously and a diagnosis of detachment of the retina made; some months later she returned with sympathetic ophthalmia. The first eye was enucleated, and the doctor states positively that the eye had never been perforated in any way. The enucleated eye was sent to Deutschman for microscopical examination and disclosed a spindle-celled sarcoma. It also contained micro-organisms to which he ascribes the inflammation in the other eye. Deutschman reported a similar case in 1889, as did also Brailey²⁶ in 1890, and at the Berlin International Congress Brailey drew especial attention to these tumors, and used this fact as an argument against the migration theory.

Schirmer, in his work already quoted, suggests that the only other method which could cause sympathetic ophthalmia would be that the sarcoma produces a phlogogenetic substance, and thus causes the disease, in the same manner as Leber supposes that brain tumors produce a toxine which leads to papillitis; or the infection might be endogenous; or, finally, this might simply have been an incidental complication.

A case which has direct bearing on this subject was reported by Dr. F. Pincus.²⁷ An eye, which had been amaurotic for fourteen years, becoming painful, the individual applied at the clinic at Jena for relief. The diagnosis "luxatio cataractæ iridodialysis" was made, the extraction followed, and, against the advice of the physician, the eye still being slightly inflamed, he left the clinic on the nineteenth day. Two months later he returned with a pronounced case of sympathetic trouble. The first eye was enucleated, and examination revealed the astounding fact that the eye contained in its upper segment a calcareous cysticercus, with hooklets present, and this had evidently led to the loss of vision some fourteen years previously. The wound following the operation had not healed perfectly, and examination for bacteria showed that micrococci and bacilli had entered at the cicatrix, and these could be followed into the optic nerve sheath, even into Tenon's space, more especially, however, in the region of the cicatrix and posteriorly at the entrance of the optic nerve. Dr. Pincus concludes that it is unreasonable to suppose that the operative insult to the ciliary body, in which an irritant was already present, could lead to a reflex transference to the other eye. The micro-organisms in the cicatrix, the interior of the eye, and in the lymph sheath led to sympathetic ophthalmia. He also describes a case following a cataract extraction in which he conclusively proved the presence of micro-organisms in the cicatrix and in the lymph space. Both cases demonstrate the truth of Deutschman's theory.

But undoubtedly the great majority of cases result from perforating wounds, with or without the retention of a foreign body. There can hardly exist a doubt to-day that it is not the

wound but the *infection* which leads to the disease. Should the wound be the result of a stab with a knife blade, a puncture with a knitting needle, a small branch of a tree, a cow's horn, or even a severe contusion and perforation by a block of wood, most naturally, if the injury is great, enucleation is evident; but when the injury is slight or posterior to the ciliary body it becomes a matter of no small consequence to decide what shall be done. Should one temporize until the inflammation develops—frequently the hæmorrhage into the anterior chamber, a traumatic cataract or a hæmorrhage into the vitreous, obstructs one's view, and as we have seen the micro-organisms are carried into the eye, reach the lymph circulation, reach the optic nerve sheath, and now—even though an enucleation be made, it comes too late, and we are helpless to stay the involvement of the second eye. True, if the media are clear, if the eye does not react violently, heals rapidly and becomes pale, it is fair to assume that no infection has taken place. But whenever an infection has taken place there should be no hesitancy as to how to proceed.

But where the foreign body has been retained (usually this is a minute piece of iron, steel, lead, copper or glass), Schirmer seems to believe that the danger of foreign bodies in the eye has been greatly overestimated. It is a well known fact that aseptic fragments of steel, even stone, may become encapsulated and remain perfectly latent for years. However, it may also be stated that even these capsules lead to tension on the vitreous, and in course of time to its destruction and eventually to the loss of the eye. Leber,²⁸ in his book, has proven that all the above-named substances, even gold and silver, are gradually acted on by the fluid media of the eye, minute quantities gradually dissolved off, and this acts as an irritant, causing a purulent inflammation which may be aseptic in its nature. He lays particular stress on the fact that aseptic pus may develop in the human eye, and considers the recognition of this fact as a great step forward and of the greatest therapeutic value. Formerly the general opinion prevailed that all such eyes containing pus ought to be enucleated at

once, but after it was shown that sympathetic ophthalmia is an infection, hence one is justified in trying to save an eye, provided one can show to a certainty that the pus is of aseptic origin. Hence, such conservative action is to be restricted to cases in which the formation of pus is restricted to the immediate neighborhood of the foreign body and the symptoms of a general inflammation are wanting, and, *above all*, if cultures of the exudate prove the absence of micro-organisms. However, should micro-organisms prove to be present, notwithstanding the successful extraction of the foreign body, the subsequent enucleation is indicated; whereas, if microbes are found wanting, one may attempt to save the eye, at least as long as the clinical course justifies it.

The shortest interval which has been noted to elapse between the injury and the involvement of the second eye has been placed at two or three weeks. To quote Schirmer once more the shorter the interval, the less the probability that the disease is due to an intercurrent affection, whereas the longer the interval the greater does the probability become. In many of the cases reported the statement is made that the first eye was not inflamed, for without irritation and inflammation of the first eye there can be no sympathetic inflammation of the second.

The attempt has been made to explain the occurrence of serous and plastic disease of the uveal tract in the second eye, instead of a purulent infection, on the hypothesis that the germs which reach the second eye are attenuated,²⁹ and have lost much of their virulence, so that they no longer lead to the formation of pus, but rather to a chronic inflammation, with the production of plastic, and later on to the formation of connective-tissue bands. As yet no specific micro-organism has been found. Streptococci, staphylococci and even short bacilli have been found, and no doubt this infection is a mixed one, and *any of the pathogenic germs which produce ptomaines and virulent toxins can produce sympathetic ophthalmia.*

The papillitis and retinitis which have been observed in the second eye are no doubt due either to the diffusion of tox-

ines, which precede the arrival of the microbes, in their descent along the lymph space surrounding the optic nerve of the second eye, or to the direct involvement of the nerve in the inflammatory process by the direct action of the germs on the same; whereas, the uveitis only comes on after the germs have been carried into the uveal tract. Therefore, as a result of our investigations, we are forced to admit that *sympathetic ophthalmia is an infection of the second eye, the result of an infection of the first*, the micro-organisms being carried or propagated along the sub-vaginal lymph space of the optic nerve sheath to the chiasm, and thence down the lymph space of the second optic nerve sheath to the second eye. Further, *every perforating wound*, be this the result of accident, operative procedure or pathological conditions, the result of disease, accident or operation (such as perforating corneal ulcerations, cystoid cicatrization, or staphylomata with formation of fistulous tract, etc.), *opens the door for the entrance of pathogenic microbes, without which there can be no sympathetic ophthalmia*. Deutschman has given this disease a better name, *ophthalmia migratoria*.

This forces us to admit that sympathetic ophthalmia and sympathetic neurosis are two fundamentally different diseases; whereas, the former is an infection, the latter is simply a neurosis. Further, whereas, the removal of an amaurotic eye for sympathetic irritation relieves the irritation, the removal of an eye for developed sympathetic ophthalmia will not influence the course of the disease in the second eye.

It should not be forgotten that sympathetic ophthalmia has been known to develop *after* an enucleation, the infection having reached the lymph space before the enucleation. Hence, *all treatment must have as one of its prime objects the prevention of an infection. After an eye has once been infected, the prime indication should always be to prevent an infection of the second eye.*

In conclusion the following rules as to treatment are suggested:

1. If the injury is severe and extensive, enucleate at once.

2. If the injury is slight, await developments, keeping the patient under observation; and if irido-cyclitis or purulent inflammation sets in, enucleate at once.

3. If a foreign body is lodged in the eye, (*a*) if it can not be extracted, enucleate; (*b*) if successfully extracted, determine if it is aseptic— if not aseptic the subsequent enucleation is indicated.

4. If the case comes under observation with sympathetic disease developing, (*a*) should the exciting eye be totally blind, enucleate; (*b*) should the exciting eye still possess some vision, do not enucleate, for experience has proven that, as a rule the second eye is hopelessly involved, and the only vision left may be in the first affected eye.

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PRELIMINARY REPORT ON SIX HUNDRED AND TWELVE CASES OF CONVERGENT SQUINT, WITH SPECIAL REFERENCE TO THE RESULTS OF OPERATION.¹

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Carefully tabulated statistical reports of the results of operations undertaken for the cure or improvement of convergent squint have formed but little part of the ophthalmic literature of the last fifty years; and this fact has produced in the minds of the profession at large, and especially in the minds of some ophthalmologists, the feeling that the operation of tenotomy for the cure of squint is of doubtful value in many cases. The absence of useful, working statistics on this point has, no doubt, been largely due to the fact that it is extremely difficult to follow out these cases for a sufficiently long time after the operation, because the patients are so easily lost sight of.

¹Abstract of a paper read before the American Ophthalmological Society, July 17, 1895.

especially if they be hospital cases, and if the first operation has proved only partially successful.

The feeling that operative procedures for the cure of squint are of doubtful value in many cases arises largely from the discrepancy in our ideas as to what constitutes a "cure" of convergent squint. If by "cure" is meant merely the removal of all visible disfigurement, with apparent restoration of parallel axes of the eyes, then the results of operation should be deemed very satisfactory. But if something more is meant, and we understand by the word "cure" not only the apparent restoration of parallel axes, but the improvement of vision in the squinting eye, the establishment of binocular vision, and the ability of the patient to use the eyes for all purposes, except close work, without correcting glasses, then our ideas of the value of tenotomy must be materially modified.

So wide is the difference of opinion among ophthalmologists as to the existing conditions in squint, the value of operative interference, and the nature of the operation which is to be done, that the writer has long held the view that the whole subject of strabismus is the least understood by modern ophthalmologists in the whole domain of ophthalmic science. We need but to glance over our text-books and the contents of our journals to be really convinced of the truth of this statement. Leaving entirely out of consideration the different views that are held as to the nature and causation of squint, there are many of our colleagues who question the wisdom of operating in early childhood, while others hold that in many instances no operation is necessary.

It is not the intention of the writer of this paper to enter into a discussion of the general subject of squint. The paper is intended to be merely a preliminary report on the effects of operative interference upon the condition of abnormal convergence of one or both eyes, including such other statistical details as may be necessary for a proper appreciation of the results obtained.

The entire number of 612 cases occurred in the private and hospital practice of the writer, and all the cases were care-

fully followed up and watched for a length of time varying from six months to ten years. All examinations of the refractive and muscular conditions of these cases, all the various operations, and all subsequent observations were made by the writer himself. A much larger number of patients have been examined and operated on than the 612 here considered, but the cases could not be followed with any accuracy for a longer period than a few weeks, and hence they have formed no part of these statistics. Whatever conclusions may be drawn from these statistics must therefore be based solely on the 612 cases here tabulated.

No cases of a person under six years of age has been included, owing to the difficulty of testing the refraction and of obtaining anything like an accurate idea as to the existing acuity of vision in very young patients. In all cases of equal or approximately equal refraction, full correction by glasses was ordered immediately after the operation, and these glasses the patients were directed to wear constantly for a varying length of time. The faithfulness with which these directions were carried out varied with the frequency with which the patients were subsequently seen, and the length of time they were under observation. When the refraction differed markedly in the two eyes, full correction for the non-squinting eye and partial correction for the squinting eye was ordered, and in some instances the strength of the latter glass was increased as time elapsed.

The cases were about equally divided between the sexes, there being 304 males and 308 females.

The refraction was in the great majority of instances hypermetropic, these statistics agreeing on this point with all previous statistics hitherto published. The refractive condition of the 612 cases was as follows:

Simple hypermetropia in 521 cases.

Simple hypermetropic astigmatism in 24 cases.

Compound hypermetropic astigmatism in 34 cases.

Simple myopia in 13 cases.

Simple myopic astigmatism in 3 cases.

Compound myopic astigmatism in 2 cases.

Emmetropia in 15 cases.

There were 57 cases of anisometropia and 2 cases of amblyopia.

The 15 cases of emmetropia were so regarded because, while under the influence of atropine, the vision for twenty feet was made perceptibly worse by a glass of + D. 0.50, whether spherical or cylindrical.

A Study of the tables showing the degree of refraction in each case gives some interesting data.

The 579 cases of hypermetropic refraction were divided as follows:

Under D. 1, in one or both eyes, 27 cases.

Between D. 1 and D. 2, in one or both eyes, 205 cases.

" D. 2 and D. 3,	"	"	"	147	"
" D. 3 and D. 4,	"	"	"	95	"
" D. 4 and D. 5,	"	"	"	76	"
" D. 5 and D. 6,	"	"	"	51	"
" D. 6 and D. 7,	"	"	"	20	"
" D. 7 and D. 8,	"	"	"	5	"
" D. 9 and D. 10,	"	"	"	1	case.

Over D. 10, in one or both eyes, 2 cases.

The cases of myopic refraction varied between D. 0.50 and D. 9.

Amblyopia or defective visual acuity was a very marked feature in the squinting eye, as might have been expected, but a study of the tables shows also a more or less decided sub-normal acuity of vision in the fellow eye. The tables also show a by no means inconsiderable number of cases in which there was no loss of visual acuity in either eye.

There was defective vision in the squinting eye in 236 cases, or about thirty-seven per cent.

There was defective vision in both eyes in 291 cases, or about forty-eight per cent.

There was no amblyopia in either eye in 85 cases, or about fifteen per cent.

The tests for vision were made first without the use of

atropine, and subsequently the accommodation was paralyzed and the tests repeated in all cases, except where the age of the patient rendered it unnecessary.

The operative procedures employed in the treatment of these cases consisted of simple tenotomy of one internal rectus; tenotomy of the internal rectus of each eye at different periods; simultaneous tenotomy of both internal recti; tenotomy of the internal rectus of one eye and advancement of the external rectus of the same eye; tenotomy of the internal recti of both eyes and advancement of the external rectus of the squinting eye; and simultaneous tenotomy of the internal recti of both eyes, followed at a varying length of time by a second tenotomy of the internal rectus of the squinting eye.

Simple tenotomy of the right internal rectus was done in 72 cases.

Simple tenotomy of the left internal rectus was done in 92 cases.

Tenotomy of both internal recti at different periods was done in 18 cases.

Simultaneous tenotomy of the internal rectus of both eyes was done in 20 cases.

Tenotomy of the right internal rectus and advancement of the right external rectus was done in 91 cases.

Tenotomy of the left internal rectus and advancement of the left external rectus was done in 131 cases.

Tenotomy of both internal recti and advancement of the external rectus of the squinting eye was done in 14 cases.

Simultaneous tenotomy of the internal rectus of both eyes and subsequent tenotomy of the internal rectus of the squinting eye was done in 6 cases.

The results of the various operations upon the degree of the squint were as follows:

Simple tenotomy of the internal rectus of one eye was done in 164 cases. The final result was:

Convergence in 102 cases, or about sixty-two per cent.

Parallelism in 55 cases, or about thirty-three and a third per cent.

In all cases of resulting convergence, the degree was much less than before the operation. No second operation in any one of these 102 cases was permitted.

Tenotomy of the internal rectus of both eyes at different periods was done in 186 cases. The final result was:

Convergence in 144 cases, or about seventy-eight per cent.

Parallelism in 33 cases, or about seventeen per cent.

Divergence in 9 cases, or about five per cent.

Simultaneous tenotomy of both internal recti was done in 20 cases. The final result was:

Convergence in 13 cases, or about sixty-six per cent.

Parallelism in 1 case, or about five per cent.

Divergence in 6 cases, or about thirty per cent.

Tenotomy of the internal rectus and advancement of the external rectus of the squinting eye was done in 222 cases. The final result was:

Convergence in 38 cases, or about sixteen per cent.

Parallelism in 178 cases, or about eighty per cent.

Divergence in 6 cases, or about two and four-fifths per cent.

Tenotomy of the internal rectus of both eyes and advancement of the external rectus of the squinting eye was done in 14 cases. The final result was:

Convergence in 3 cases, or about twenty-one per cent.

Parallelism in 9 cases, or about six per cent.

Divergence in 2 cases, or about fourteen and two-sevenths per cent.

Tenotomy of the internal rectus of both eyes, and subsequently a second tenotomy of the internal rectus of the squinting eye, was done in 6 cases. The final result was:

Convergence in 3 cases, or fifty per cent.

Parallelism in 1 case, or about sixteen and two-thirds per cent.

Divergence in 2 cases, or about thirty-three and a third per cent.

The general percentage of final results was as follows:

Whole number of cases operated was 612.

Resulting *convergence* in 307 cases, or about fifty per cent.

Resulting *parallelism* in 277 cases, or about forty-five per cent.

Resulting *divergence* in 32 cases, or about five per cent.

In all cases in which convergence was the final result, the degree of convergence was decidedly less than that of the original defect.

A few words now in regard to the question of the supposed improvement in vision of the squinting eye

There was an improvement in the visual acuity of the squinting eye alone, after the operation, in 7 cases.

There was an improvement in the vision of the fellow eye alone in 65 cases.

There was an improvement in the vision of both eyes in 14 cases.

A somewhat careful study of these cases has led me to the conclusion that the instances of improvement in the visual acuity were undoubted, but that, while occurring *after the operation*, they could not be considered as *due to the operation*, but rather to the stimulating beneficial effect induced by wearing the full correction of the refractive error.

Complications.—A number of the cases were complicated by other lesions, the existence of which may have had some influence upon the final result after operation.

There were 30 cases in which there was more or less marked loss of power in the external rectus. In 6 of these cases the paresis of the muscle was due to diphtheria, and in 4 cases to falls upon the head. There were 9 cases of more or less marked blepharitis or blepharo-adenitis, all of which recovered after the operation and fitting with correcting glasses. There were 2 cases of strabismus sursumverges associated with the convergent squint, and in both the upward deviation disappeared after the operation. There were 18 cases of corneal opacity more or less distinctly marked.

In 7 cases the appearance of the squint had been immediately preceded by measles, and in 2 cases by scarlatina.

General chorea existed in 2 of the cases and rotary nystagmus in 8 cases.

In 8 cases the squint had followed an attack of epileptiform convulsions, and in 3 cases it occurred during an attack of pertussis.

The convergence was complicated in 2 cases by congenital ptosis; in 1 case by facial paralysis, and in 2 cases by entropion.

In two of the myopic cases detachment of the retina occurred after the operation.

In four cases there was no fixation with the squinting eye either before or after the operation.

A cursory review of the final results of the operation on the degree of the squint would leave the surgeon to believe that the greatest effect is to be expected from tenotomy of the internal rectus and advancement of the external rectus of the squinting eye, and that the method of operating by simultaneous tenotomy of the internal recti of both eyes is the least valuable.

A more careful study of each case, however, has led the writer to the formulation of the following conclusions, which may be modified by lapse of time and a larger experience:

1. If the squint is in one eye and of the alternating variety, there is usually very little amblyopia in either eye and but little difference in the refractive error of the two eyes. In the majority of these cases free tenotomy of the internal rectus of the eye which usually squints, with immediate full correction of the refractive error, will give as a final result either apparent parallelism or such a slight degree of convergence as is not noticeable under the glasses.

2. If the squint is always in the same eye there is almost always a decided difference in the refraction of the two eyes and a decided amblyopia in the squinting eye. In these cases, if there is no loss of power in the external rectus, the best results are gained by tenotomy of the internal rectus and advancement of the external rectus of the squinting eye and subsequent full correction by glasses.

3. If there is marked amblyopia in the squinting eye and some loss of power in the external rectus of the same eye, the

best operation will be found to be tenotomy of the internal rectus and advancement of the external rectus of the squinting eye, and at a varying period later tenotomy of the internal rectus of the other eye. Simultaneous tenotomy of the internal rectus of both eyes and advancement of the external rectus of the squinting eye is not a desirable operation in these cases, as it too often leads to permanent divergence.

4. If, however, the squinting eye is markedly amblyopic and the external rectus of this eye is entirely paralyzed, the best results are gained by a simultaneous tenotomy of the internal rectus of both eyes and advancement of the external rectus of the squinting eye.

5. In the emmetropic cases, fifteen in number, the best results were gained by tenotomy of the internal rectus of the squinting eye, followed at a varying period by tenotomy of the internal rectus of the other eye. The reason for this is not as yet apparent.

6. There will always be a number of cases, by no means inconsiderable, in which it will be impossible to decide in advance what method of operating will be likely to give the best results, and in which what we do will be more or less a matter of guess-work.

7. Any complication which interferes with the visual acuity of a squinting eye, such as corneal maculæ, striæ in the lens, or extensive choroidal atrophy, must be regarded as pointing to the necessity of more extensive operative interference than simple tenotomy, even when no great refractive difference exists between the eyes and where no paresis of the external rectus is present.

In studying closely the statistics of a considerable number of cases of convergent squint, one of the lessons taught is that though defective vision is probably one of the causes of permanent squint, yet the results of the operation are satisfactory in a very large number of cases. Another fact that becomes evident is that in a by no means inconsiderable number of cases a tenotomy on the squinting eye is useless, and we are forced to do a tenotomy on the other eye.

Schweigger seems to be correct in saying that in the majority of these cases periodic squint is cured by a simple tenotomy, and that an imperfect result can be supplemented by tenotomy on the other eye.

The absence of fixation in the squinting eye in some cases of marked amblyopia renders it doubtful whether a satisfactory final result can be gained by any operation. Not a few cases may be found in the tables (presented with the paper at the meeting) in which only slight improvement was gained even by tenotomy of both internal recti and advancement of the external rectus of the squinting eye.

It should not be forgotten that a primary good result very often retrogresses, and surgeons do not sufficiently consider that the strength of the antagonistic muscle exerts a powerful influence on the ultimate result of the operation. Apparent loss of power in the external rectus does not always mean actual loss of power, and Schweigger has some reason for recommending gymnastic exercise of the muscles by alternately turning the eyes to the right and left as a useful preliminary to the operation for squint. It is a mistake to suppose that advancement of a muscle immediately brings about a permanent position of this eye, for, as in simple tenotomy, the immediate result never remains permanent, but usually diminishes somewhat, though it may increase.—*New York Medical Journal*.

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ORIGINAL ARTICLES.

DERMOID TUMORS OF THE CONJUNCTIVA.

BY DR. S. C. AYRES, CINCINNATI, OHIO.

These tumors are congenital and are generally seen singly. Dr. Noyes reports an exceptional case where he saw three on one eye. They are usually located partly on the cornea and partly on the conjunctiva, but are occasionally seen on the conjunctiva alone. They do not give much annoyance until after the age of puberty when hairs begin to grow on them. The sweeping of the upper lid over the projecting hairs gives rise to some irritation requiring their extraction for relief. They vary in diameter from 3 m. to 6 mm.

Their removal is quite safe and should not be followed by any inflammatory reaction if proper protective precautions are taken for a few days after the operation. The eye should be kept bandaged until the denuded surface has quite thoroughly healed over.

The rarity of this form of growth is my apology for presenting three

CASE I.—Mr. S., aged 24; has a large dermoid tumor of the right eye situated on the outer side. It is 6 mm. in diameter. Recently it has given him considerable annoyance and becomes inflamed when exposed to dust or wind. It has a few hairs growing from its center. It is quite flat and not so much elevated as the others I shall report. It was removed by seizing it with a pair of fixation forceps and then with a Graefe knife carefully dissecting it off the cornea and sclera. Pressure bandage was applied for a few days and the denuded surface healed over quickly.

CASE II.—J. J., mulatto; has a dermoid tumor of the eye which he considers unsightly and which occasionally annoys him. In other respects the eye is normal. A few black hairs grow from the center of the tumor, and its surface is dotted over with pigment points such as are seen on the conjunctiva of the mulatto.

Operation was recommended but to this he would not consent.



CASE III.—Mr. A., aged 25; has a dermoid tumor of the left eye which is annoying from the hairs which grow from its center and which have to be extracted occasionally. He also has a mole in front of the tragus of the left ear. The tumor is rounded and quite convex, and lies about equally on the cornea and sclera. There is a very narrow area of corneal opacity around the base of the tumor. It was excised without any re-

action following. A saturated opacity of the cornea marks the area covered by the tumor.

Dermoid tumors or moles of the eyeball are associated with coloboma of the eyelids. Sutton, in his work on "Tumors, Innocent and Malignant, explains their development in the following way: "In the embryo the tissue covering the outer surface of the eyeball, which ultimately becomes the conjunctiva is directly continuous, and in structure is identical with the skin at the margin of the orbit. Very early cutaneous folds arise, gradually grow over the surface of the eyeball, and come into apposition at a spot corresponding to the future palpebral fissure. These folds ultimately become the eyelids. The surface of these folds, which are continuous with the covering of the eyeball, become converted into mucous membrane, and are termed conjunctiva. It is reasonable to suppose that, as the occlusion of the proper covering of the eyeball by the eyelids is the cause of the conversion of the conjunctiva into mucous membrane, if from any cause a part, or even the whole of it, were left uncovered, the exposed part would persist as skin."

He further states that "conjunctival moles have been observed in horses, sheep, oxen and dogs, and are furnished with hair or wool according to the nature of the tegumentary covering characteristic of the mammal in which they occur."

SOCIETY PROCEEDINGS.

SIXTY-THIRD ANNUAL MEETING OF THE BRITISH
MEDICAL ASSOCIATION, HELD IN LONDON
JULY 30, 31, AND AUGUST 1 AND 2, 1895.

SECTION OF OPHTHALMOLOGY.

INTRODUCTORY REMARKS

BY HENRY POWER, M.D., F.R.C.S.,

President of the Section.

After the warm expressions of welcome that have been addressed to the members of the Congress generally by the President little remains for me to add except that the ophthalmologists of London in a more special manner greet with a friendly grasp of the hand all those who are practicing this important department of medicine in other cities and towns of Great Britain or who have come to visit us from other countries. I am sure I am expressing the sentiments of the metropolitan members of this Congress when I say that we feel ourselves highly honored by their presence on this occasion, and that we trust they will not only derive profit from the numerous papers on interesting subjects that have been promised to us, but that they will receive some pleasure from the various objects of interest to be found in this great city and its vicinity. Half a century ago no such friendly situation could have been offered, because ophthalmology, though full of vitality, had not yet reached the stage of separate existence, but was still

merged in general surgery, few or none practicing it with exclusiveness.

Within that period, however, great changes have occurred. Affections formerly lightly passed over or altogether disregarded have been found to require for their elucidation prolonged and careful inquiry, and new means and methods of research have been added to our previous stock. The ophthalmoscope invented by Helmholtz, the distinguished physicist and physiologist, whose loss we have had so recently to deplore, opened up a vast field of study, and the revelations obtained by its employment of the changes in the intra-ocular structures is by no means exhausted. The investigation of errors of refraction and their correction in the path pursued by Donders and his school and still further developed by Landolt and others; the study of muscular anomalies and defects, so energetically worked at by our American coadjutors; the recognition of the immense practical importance of good color vision in all forms of land and sea conveyance where the traffic is regulated by colored signals; the labors of a host of clinical observers both at home and abroad in devising and perfecting methods of treatment both operative and medicinal; the gradual recognition of the fact that many constitutional diseases, as albuminuria, diabetes, leukæmia, and febrile affections generally powerfully influence vision, are all circumstances that have contributed to enlarge the horizon and to develop the resources of the ophthalmologist to an extraordinary degree. This again has led to the establishment of several special hospitals devoted entirely to the treatment of diseases of the eye, and also to the founding of departments with the same object in view in connection with each and all of our general hospitals. To discharge the duties connected with these institutions professors have been appointed, who have required the services of assistants and house-surgeons, and these in turn have been able to instruct a large number of intelligent and diligent students, and thus a sound knowledge of the nature and treatment of eye diseases has been diffused throughout the kingdom, so that whereas only a decade or two ago the unfortunate victim

of iritis or of keratitis, of squint, cataract, or glaucoma was compelled to come to one of the great centers of population, at the present time there are few towns even of very moderate size that do not possess either an ophthalmic surgeon or a practitioner capable of diagnosing and treating any of the ordinary forms of ophthalmic disease.

The foundation of the Ophthalmological Society of Great Britain has proved of the greatest service by enabling remarkable cases to be seen by all who are interested in the subject; by supplying a field where papers can be read in which new views can be advocated, or old ones subjected to wholesome criticism, and in which an *esprit de corps* can be fostered, and a fellow feeling established amongst men who have no petty jealousy, and who seek success only by honorable rivalry.

Our branch of work is by common consent the most fortunate of all in the opportunity it affords of applying methods founded on pure science to the diagnosis and treatment of disease; and so long as our ranks are recruited by those who have gone through the ordinary curriculum of medicine and surgery now required by the examining bodies, and so long as it is recognized by the profession generally that an accurate knowledge of ophthalmology will often supply the key to many constitutional affections, we need have no fear that it will separate itself from the main trunk, or become a barren branch. But this does not the less relieve us from the necessity of constantly keeping in view the scientific side of its study, and I am strongly of opinion that all those who enter the ophthalmic department to pursue it as a special study should have gone through a sound mathematical training. At the present moment this is certainly not a *sine qua non* for a candidate applying for any post at an ophthalmic hospital; but I am sure that if it were made so, it would prove of great advantage to the rising generation of ophthalmologists; that the practical work of correcting errors of refraction would be better done, and that under any circumstances it would be an efficient means of mental training.

Though the organ with which we are engaged is but small,

it is yet a theatre large enough to permit many pathological processes to be followed out, which, owing to the diversity of tissues present, are more various, and can be defined with greater precision than elsewhere; and where different modes of treatment can be strictly compared and their relative value estimated. Our diagnosis of disease is daily becoming more precise, as is shown by the circumstance that in 1842 Dr. Hockin, tabulating the statistics of six infirmaries, found that of 30,971 cases of ophthalmic disease, 16,383—or more than half—were cases of conjunctivitis, a large proportion of which would now be distributed under very different heads. No doubt much remains to be done; there are many gaps and imperfections in our knowledge. Let us hope that some of these may be filled up and removed in the labors to which we will now address ourselves.

CASE OF ACROMEGALY WITH OCULAR COMPLICATIONS.

BY A. H. BENSON, F.R.C.S.I.,

Ophthalmic and Aural Surgeon City of Dublin Hospital.

The patient was a man, aged 38, who after an injury to his leg nine years before, began to grow lazy, sleepy, and big; the sight had been affected for two or three years. There was no diathesis, either hereditary or acquired. He was a heavy smoker, had a central scotoma for colors, and a bitemporal color defect. His vision was $\frac{6}{LX}$ in each eye. After giving up smoking and taking iodide of potassium, vision was again $\frac{6}{VI}$, and remained good for two years. He then took to smoking again, and in two months vision was reduced to $\frac{5}{LX}$. At this time he presented the characteristic appearance of acromegaly, and there was irregular bitemporal hemianopsia. Thyroid extract tabloids were ordered, but the next day vision

was reduced to perception of light; fresh thyroid extract was given, and within seven weeks the vision was again $\frac{6}{VI}$. He diminished in weight, and the field of vision had improved.

DR. MEYER (Paris) mentioned three cases of acromegaly that had come under his observation. One was without ocular symptoms; the other two had diminution of central vision to $\frac{6}{XII}$ and $\frac{6}{XVI}$. Complete temporal hemianopsia, with slight decoloration of the optic discs. In one of the cases the characteristic sign of acromegaly were accompanied by pronounced tabetic symptoms; in the other the general health, with the exception of the acromegaly, was perfect. His patients were still living, but the results of the necropsies that had been made gave very different results; in some the pituitary body was altered, in others not. The most remarkable feature of Mr. Benson's case was the restoration of vision after its nearly absolute abolition.

DR. SWANZY (Dublin) pointed out that the disease, although only recently described, was not a modern one, inasmuch as marked signs of it were present in the skeleton of the Irish giant Cornelius Magrath, preserved in the museum of Trinity College, Dublin. He lived in the early part of the last century, and it was only about two years ago that a careful examination of the skeleton proved that the giant had been the subject of acromegaly; the sella turcica was so dilated that a small walnut could be placed in it; the groove for the chiasma had disappeared, as also the posterior clinoid processes.

DR. LITTLE (Manchester) had seen only one case of acromegaly associated with eye symptoms. A gentleman, aged about 30, consulted him about eighteen months ago with failing sight of the left eye of three or four weeks' duration. The vision was equal to $\frac{6}{XVIII}$, refraction normal; optic nerve pale as compared with the other, but that was doubtful. Other eye normal. A month afterwards there was distinct atrophic change in the optic nerve; no neuritis; field contracted upwards outwards. Two months later there was marked atrophy and vision=Jæger 20; the right eye was still normal.

PROFESSOR PANAS (Paris) said that the case observed

by him regarded a woman aged 35, affected with typical acromegaly, preceded by epileptic attacks. The disease was accompanied with hypertrophy of the thyroid gland. The urine contained a large quantity of sugar and albumen. The ocular trouble consisted in bitemporal hemianopsia, the separation line being placed precisely in the middle of the visual field; proof that compression due to the enlargement of the hypophysis, weighed on the posterior angle of the chiasma. He considered that the acromegaly was due in that case to an alteration of the central nervous system, which produced the enlargement of the thyroid gland, and hypophysis, diabetes with albuminuria, and the epileptic attacks at the first stage of the disease.

PROFESSOR FUCHS (Vienna) said the central scotoma in Mr. Benson's case might be due not to tobacco amblyopia, but to a connection with the hemiopia. He had seen a case, which was supposed to be a tumor of the intracranial part of one optic nerve, spreading over to the other half of the chiasma. There was complete blindness in one eye, and temporal hemiopia in the other; this hemiopia was preceded by a central scotoma, which disappeared later on, and normal vision was restored. He thought that the scotoma was due to the inflammatory œdema which is so often found in the neighborhood of the tumor. This œdema might have caused a transient functional trouble in the papillo-macular bundle, which is especially liable to be implicated in pathological conditions of the various kinds.

DR. HILL GRIFFITH (Manchester) had had for some years a well-marked case, which had recently died under the care of a medical friend, and showed a large sarcomatous tumor of the pituitary body. There was nothing especially of interest in the form of the field defect; by pressure on the chiasma in other conditions, there might be blindness of the eye with temporal hemianopsia for form or only for color, and so forth. He had also seen one other case under the care of a colleague, and one or two others had been shown him by medical friends.

MR. SNELL (Sheffield) had seen one case of well-marked

acromegaly in a man. There was at that time an absence of eye symptoms: the field of vision for white and colors was normal, and vision was not impaired. The patient had not been examined for twelve or more months, but he was still living. Mr. Benson's case taught the lesson of repeatedly, in such a case, taking the field.

ON INJECTING CHLORINE WATER INTO THE VITREOUS.

MR. G. A. BERRY (Ophthalmic Surgeon to the Edinburgh Royal Infirmary) gave the results of his further experiments on the injection of chlorine water into the vitreous. His method of operating was to make an incision through the conjunctiva at the equator between the inferior and external recti tendons; a Graefe's knife was then plunged through the denuded sclera. The nozzle of a hypodermic syringe was next introduced into the middle of the vitreous, and 4 minims of freshly-prepared chlorine water slowly injected. The wound was cleaned with chlorine water, and the conjunctiva drawn together by sutures. Moderate chemosis followed the operation, but no other harmful effect. Where purulent infiltration of the vitreous had already set in, the process was aggravated by the injection. He hoped that more experience would prove that these injections of chlorine water would prevent the beginning of septic inflammations in the eye, especially after the removal of pieces of metal from the eye.

DR. ARGYLL ROBERTSON had seen most of Mr. Berry's cases, and could corroborate the beneficial effects spoken of; he had employed it in one case in which the result was not satisfactory, owing to the already advanced state of suppuration present.

OPTOMETRY BY THE SUBJECTIVE METHOD.

DR. G. J. BULL (Paris) believed that the only satisfactory way of testing vision by the subjective method was first to find out the astigmatism before correcting the spherical error. He

advocated the method of making the meridian of least refraction emmetropic; any astigmatia then present resolved itself into simple myopic astigmatia.

ESSENTIAL SHRINKING OF THE CONJUNCTIVA.

MR. C. G. LEE (Honorary Surgeon to the Liverpool Eye and Ear Infirmary) narrated a case in which the vision in both eyes was reduced to perception of light; the disease in the first eye being complicated with a cyst of the upper lid leading down to bare bone at the margin of the orbit.

CHOROIDAL SARCOMA IN INFANCY.

MR. JOHN GRIFFITH (Pathologist and Curator Royal Westminster Ophthalmic Hospital) narrated two cases which he considered to be undoubted instances of choroidal sarcoma—one in a child aged two and a half years, in which a section of the eyeball revealed a non-pigmented growth springing from the choroid; in the other, a child four years, a non-pigmented sarcoma completely filled the eye, and had penetrated through the ciliary region. Mr. Griffith believed sarcoma of the choroid to be more common at this period than was usually admitted; he upheld the view that glioma of the retina was a sarcoma, and objected to the term glioma of the retina.

HEREDITARY CONGENITAL NYSTAGMUS ASSOCIATED WITH HEAD MOVEMENTS.

MR. ANGUS MACGILLIVRAY (Ophthalmic Surgeon Dundee Royal Infirmary) narrated two series of cases, in one of which the nystagmus could be traced through four generations; the nystagmus was of the horizontal kind, and the head movements persisted throughout life. The affection seemed to be transmitted through females to male children. The movements in these cases seemed to form a connecting link between the infantile cases of head nodding and the tremors found in the aged.

MR. SNELL (Sheffield) said he did not know that miners' nystagmus could be regarded as hereditary, but he had often found it present in a father and his sons who were also miners. It probably only showed in these cases a tendency to the development of muscular disabilities.

MR. GEO. WALKER (Liverpool) had found considerable ametropia in several cases of nystagmus in which the movements had been much reduced on correcting the error of refraction. He suggested that the heredity of the nystagmus might depend on the presence of the ametropia.

MR. LLOYD OWEN (Birmingham) referred to two cases of family nystagmus recorded by him some years ago, in which the nystagmus descended to male children through the females; the only condition common to all members of the family was hypermetropia

EXHIBITS.

DR. KOSTER (Utrecht) described and demonstrated the use of his new Tonometer for measuring the tension of the eye.

PROFESSOR GAYET (Lyons) showed a series of Photographs illustrating the use of photography in recording the conditions of the eyes before, during, and after treatment.

A NEW THEORY OF ERYTHROPSIA.

PROFESSOR FUCHS (Vienna), as the result of his excursions into the snow-covered mountains near Vienna, came to the conclusion that erythropsia is a common occurrence in healthy eyes; he could produce it at will in patients who had had their lenses removed by sending them to walk in the snow. From the result of his experiments he had come to the conclusion that the erythropsia was produced by the visual purple becoming visible during its formation after exhaustion of it in the retina by long exposure to dazzling light.

THE TESTS FOR COLOR BLINDNESS.

DR. EDRIDGE-GREEN, after giving a summary of the known

facts of color blindness, went on to say that colored objects of different materials should be used as classification tests, and also colored lights, modified if necessary by neutral glasses, which altered the color of the light to the color blind but not to the normal sighted.

THE INFLUENCE OF THE CEREBRUM AND CEREBELLUM ON EYE MOVEMENTS.

DR. RISIEN RUSSELL, after describing his former work on this subject, went on to say that it was possible to demonstrate even in the dog and cat the existence of distinct foci in the cerebral cortex related to each simple movement of the eyes. With all the external ocular muscles intact the invariable result of excitation of the frontal eye area was the movement of both eyes to the opposite side; when this movement was excluded by dividing the external rectus of the opposite eye and the internal rectus of the eye on the side of the hemisphere stimulated, it became possible to demonstrate the existence of a focus, stimulation of which resulted in simple upward movement of the eyes. Further, after division of the muscles that raised the eye, a focus could be demonstrated, stimulation of which resulted in simple downward movement. Evidence was adduced to show that the true action of these centers in the cortex must be to initiate movement by their action on lower centers. The author went on to describe the effect on movements of the eyes of removing the lateral and middle lobes of the cerebellum.

ERRORS OF REFRACTION IN NEURASTHENIC WOMEN.

DR. H. MACNAUGHTON JONES read a paper on The Importance of Correcting Errors of Refraction in Neurasthenic Women, in which he stated that of 270 women who had consulted him for affections of their pelvic organs 53 complained of head symptoms. A large proportion of these suffered from varying degrees of hyperopic astigmatism; 28 were completely

cured or greatly relieved of their head symptoms by correction of their refractive error.

ON THE QUESTION OF LATENT HYPERMETROPIA IN THE VISUAL EXAMINATION OF CANDIDATES FOR THE PUBLIC SERVICES.

MR. W. M. BEAUMONT (Bath) in this paper pleaded for more definite regulations with regard to the question of latent hypermetropia in the examination of candidates for the public services.

THE SURGICAL TREATMENT OF DISLOCATION OF THE LENS INTO THE ANTERIOR CHAMBER.

DR. GEORGE MACKAY (Edinburgh) asked for the experience of his colleagues upon the question of what proportion of cases received permanent benefit from reduction of the dislocation. His own experience was in favor of the employment of a needle to fix and remove the lens from the path of the knife while making the corneal section, and to prevent its falling back into the vitreous whilst the vectis is being passed behind it.

MESSRS. PRIESTLY SMITH, DRAKE BROCKMANN, EMRYS JONES, and GEO. WALKER narrated their experience.

A NEW OPERATION FOR TRICHIASIS.

MR. KENNETH SCOTT (Cairo) described the operation which he had performed in its perfect form on 374 cases with invariable success, except in 9 cases where the eyelids had been deformed by previous operation.

EPISCLERITIS PERIODICA FUGAX.

BY PROFESSOR DR. ERNST FUCHS.

University of Vienna.

I mean by the name "episcleritis periodica fugax" a special form of frequently recurring inflammation of the eye, which attacks pre-eminently the conjunctiva and the episcleral tissue, runs its course without extensive exudation, and is of a very transitory nature. The symptoms of the disease are in many cases so characteristic that we can from the history alone, with great probability, diagnose the same. I think it best to relate some of the special characteristics of the 23 cases which I collected.

I will begin with one of the simplest cases. A man 24 years of age, had fourteen years ago for the first time an inflammation of the right eye, which lasted eight days. After eight days' interval the left eye became inflamed, likewise for eight days. Up to three years ago the inflammations repeated themselves, always in such a manner that, after intervals of two or three months, sometimes the right eye, sometimes the left, began to be inflamed, and that after a short intermission the other eye followed. Only twice were both eyes affected at the same time. In the last three years the disease has so far become milder that now only one eye becomes inflamed, and after an interval of two or three months the other. The cause of the relapses is unknown to the patient. During the inflammation the pain is insignificant (mostly on moving the eye), but severe photophobia is present, so that the patient during this time is unable to work. The man otherwise is in good health. As I once had the opportunity of observing the inflammation, I found it to consist of a coarse injection of the conjunctiva bulbi, and a particularly severe injection of the episcleral vessels. A sclerotic node was not present.

The following case shows us a patient with gouty predis-

position, in whom the traveling of the inflammation was distinctly to be seen, also the partaking of the ciliary body in the hyperæmia. The patient is a man aged 50, wealthy and living well, whose urine on cooling deposits a sediment, which consists of uric acid and oxalate of lime. The amount of uric acid is, in comparison, slightly increased, yet the patient has otherwise no gouty appearance or symptoms. The attacks of inflammation of the eyes have existed for five months; they last usually eight days, and travel from one eye to the other. When I saw the patient the inflammation began in the left eye on the outer side of the cornea, jumped from there to the inner side of the same eye, and then over to the right eye, where it first attacked the outer side of the eyeball. In the meantime the left eye had again assumed its normal pale appearance. The inflammation consists in a coarse net-like injection of the conjunctiva and a very intense injection of the underlying ciliary and episcleral vessels. The non-inflamed parts of the eyeball were perfectly pale, especially the conjunctiva of the fornix and of the lids. Pain was present with movement of the eye, and on accommodating. It was probably as the result of these pains that I found during the attack that the near point was removed about 40 centimetres away, while during the intervals of freedom from an attack it was 25 centimetres. The refraction and acuteness of vision remained unchanged.

It more frequently happens, however, that the hyperæmia of the ciliary body leads to a spasm of accommodation, and therefore to an apparent myopia. This will be illustrated in the following case, which is, moreover, interesting on this account, that there comes here into play not the uratic diathesis, but intermittent fever as the cause of the disease. The patient is 31 years of age, and a laborer. He declares that in other respects he is perfectly healthy, and knows nothing of having passed through a fever. The internal examination showed, however, rather significant enlargement of the spleen. The patient has suffered since the year 1883 from inflammation, which alternately attacks both eyes. The attacks occur every

two or three weeks and lasted in the beginning only one to two days, later four to five, or even eight days; and while at first the eye during the attack was only reddened and not painful, there were present later severe pains, which radiated to the forehead, nose, and ear. The inflamed eye is also extremely sensitive to the touch. During the attack the patient sees as through a mist: he has also fever and great thirst. The patient showed himself for two years from time to time in the clinic, and was observed during several attacks. The inflamed eye showed conjunctival and ciliary injection, but was otherwise of normal appearance. Only the vision was diminished, and moypia was present. This varied according to the severity of the attack, amounting during the inflammation to 3 dioptrics; the vision was thereby reduced to $\frac{6}{xviii}$. During the time of freedom from inflammation there was present emmetropia and vision $\frac{6}{vi}$. The treatment consisted in quinine, which did not abort the attack, but when the patient had taken quinine for a long time the attacks did not occur, so that there were intervals of two to three months. But as the patient always ceased to take the quinine on account of the expense, the attack soon returned.

The involvement of the deeper parts in the inflammation expressed itself also in the fact that the pains often become especially prominent with movement of the eye. Many patients can predict the onset of the attack in that by fixation of the finger held before the eye they experience pain in consequence of the accommodation and convergence. The inflammatory oedema can extend so far posteriorly that even exophthalmos arises.

It is quite frequent for the inflammation to be associated with a similar affection of the mucous membrane of the nose, and the inflammation of the eye frequently begins with a severe nasal catarrh, the predisposing cause of these attacks seems to be a cold.

The following case is a fair example of this kind; it also goes to show that the presence of uratic diathesis need not necessarily be the cause of the inflammation of the eye. A

man, 46 years of age, the owner of a large estate, has been since the year 1887 exceedingly sensitive to change of temperature. As soon as he exposes himself to such he acquires a severe acute nasal catarrh and inflammation of the eye.

In the first years he was so sensitive, that the mere taking hold of the cold doorknob, or the resting of his elbow on a marble plate was sufficient to make him sneeze thirty times in succession, and an acute nasal catarrh and inflammation of the eye soon followed. Also later, when the sensitiveness had diminished, it was sufficient to go out of a warm room into a cold one for these symptoms to appear. The patient is bald-headed, and a mere draught on his bald head is especially apt to produce the disease. Otherwise he can in all weather, summer and winter, remain outdoors on his estate, become heated or drenched, without catching cold. The examination of the nose showed a considerable thickening of the nasal mucous membrane, especially in the lower turbinates. These were repeatedly cauterised with the galvano-cautery, after which an improvement followed, which, however, was of short duration. The inflammation of the eye consisted in a severe reddening of the whole conjunctiva, especially the conjunctiva bulbi, which as a rule disappeared after twenty-four hours. The patient lives well, is well nourished, and has some increase of uric and oxalic acid in his urine; otherwise no gouty symptoms are present. All attempts at a cure proved unsuccessful, until he had, in the summer of 1894, the left upper canine tooth extracted. This tooth, the patient asserted, only appeared when he was 30 years old, and had come out of the palate posteriorly to the normal row of teeth, it had an unusually long root, but was otherwise healthy. Since the extraction of this tooth all these symptoms, even the sensitiveness to change of temperature, have disappeared completely.

I will not, gentlemen, take up your time any longer with histories of other cases, of which I could mention a considerable number. Those related by me are the most frequent types of the affection. The disease in question consists in a severe inflammation of the conjunctiva bulbi, but especially of the

underlying episcleral tissue. From acute conjunctival catarrh it differentiates itself by the absence of secretion and by limiting itself to the conjunctiva bulbi, of which at times only one quadrant is affected. From the usual episcleritis it is distinguished by the absence of any nodes and its very rapid disappearance, after which no traces of the disease are to be found. It consists chiefly in a severe inflammatory œdema of the episcleral tissue; the deeper structures often take part in the hyperæmia, as is shown sometimes by the presence of pains on accommodation, or movements of the eyeball; or spasm of the of the sphincter of the pupil which causes miosis, or a spasm of the ciliary muscle which produces transient myopia. The inflammation is frequently accompanied by severe photophobia, lachrymation, and pains; the latter often make their appearance before the inflammation, and denote its coming.

The duration of the inflammation is as a rule only a few days. The inflammations reappear at regular intervals, which last from several weeks to a few months. In the same case the disease may vary in its course, so that the attacks become more frequent and severe or, on the contrary, less frequent and milder. The duration of the disease is as a rule some years. After inquiry I find that only 7 of my 23 patients are now entirely cured; in one of these cases, however, the disease had lasted twenty years. The treatment in most cases of episcleritis fugax is powerless, as the long duration of the disease shows. With a diet suited for the uratic diathesis or with hydrotherapy one can at times produce an improvement, so far that the disease returns less often and gets milder. But more effective are quinine and salicylate of soda, each of these remedies having produced a complete and lasting cure in its case.

Episcleritis fugax is a rare disease; still I am sure that most of you have observed such cases. In fact the first two accurate descriptions which I find in the literature are given by English authors—namely, by Mr. Hutchinson and Mr. Nettleship. Mr. Hutchinson described this disease in his Bowman Lecture (1884) as a “hot eye.” Mr. Nettleship also reported such cases before the Ophthalmological Society in 1888. Both

gentlemen believe that the disease is similar to recurrent iritis, and eventually may pass into it, which, I must confess, I have never observed, even in the longest duration of the disease. I find that another case of this affection has been reported by Mr. Swan Burnett in 1892, who considers it as a vasomotor disturbance.

I have observed the disease most frequently in men of middle age, less often in women. Mr. Hutchinson and Mr. Nettleship claim gout to be the cause of the same: It is true that some of my patients are living in the best of circumstances, and that they excrete probably more uric acid than normal; however, they exhibited no pronounced gouty symptoms, and besides I must mention that typical gout is extremely rare in Austria. There were decided signs of rheumatism present only in one patient, who has had two acute attacks of rheumatism of the joints previous to his eye disease; instead there were indications of malaria in several cases. Although the patients had had no typical attacks of intermittent fever, still there was enlargement of the spleen present in a few cases, and in these as well as others quinine produced good effect. This drug was able to shorten an attack, or, when taken for a long time, prolong the intervals of freedom. In one case there was an immediate and entirely curative effect produced by the quinine. One must, however, not confuse the episcleritis fugax with a certain conjunctivitis, which was observed in cases of intermittent fever, with each attack or in place of the fever.

I must confess that for the large number of my cases no etiology could be found. I believe that the predisposition to this disease is caused by an abnormality of nutrition, such as gouty diathesis, malaria, and so forth. In consequence of the general disturbance, an accumulation of noxious substances takes place, which, when a sufficient amount is collected, would produce an attack of inflammation. The last provocation to such an attack is often produced by some external cause such as a change of temperature.

I thought I would first consider the disease as a vasomotor disturbance or of an angioneurotic nature, somewhat like

urticaria because one of my last cases was accompanied with urticaria. By the collection and investigation of the histories of my patients I assured myself, however, that the episcleritis differentiates itself from the angioneurotic affections; that the appearance far exceeds the simple non-inflammatory œdema; and that the attacks are of longer duration than is known of the vasomotor neurosis. As a vasomotor affection, I would like to consider transitory œdema of the lids which I have observed myself in several cases, and of which a large number of cases have been reported by others, also by English authors, as Mr. Ormerod, Mr. Jamieson, Mr. Doyne, Mr. Gunn, Mr. Collins and other.

MR. BERRY (Edinburgh) believed that this disease was known to all ophthalmologists, though probably under different names. It was probably the same disease as that described by v. Graefe. under the term "subconjunctivitis." It was not a conjunctivitis, as the secretion was not increased. It was possibly in some cases the prodroma of something more severe—iridocyclitis or scleritis.

DR. EMRYS JONES (Manchester) had had three cases of this disease, which agreed entirely with Professor Fuchs' account of it. One of them was very obstinate, and resisted all kinds of treatment, both local and general, for more than a year; he at last performed peritomy with great and lasting benefit. He had since done peritomy in the other two cases, with marked benefit.

MR. PRIESTLY SMITH (Birmingham) thought the affection a difficult one to define. It was probably allied with episcleritis, with urticaria, with hay fever and herpes. In addition to the local cause there was often a systemic cause present as well—gout, rheumatism, or faulty elimination of some kind. He advocated systematic drinking of hot water in the morning and at night, as useful in eliminating waste products and removing the tendency to congestive states.

MR. CRITCHETT thought these cases were probably of rheumatic origin. He found great benefit resulted from salicin and quinine, hot water internally and lamp baths.

[TO BE CONTINUED.]

SELECTIONS.

HYSTERICAL AMBLYOPIA AND AMAUROSIS. REPORT OF FIVE CASES TREATED BY HYPNOTISM.¹

BY J. ARTHUR BOOTH, M.D.,

Consulting Neurologist to the French Hospital, New York City.

We may define hysteria to consist of such a condition of the general nervous system, original or acquired, as renders it capable of simulating most local diseases; of complicating them in their progress and modifying them in their usual phenomena. The number of derangements and diseases which hysteria is capable of simulating is well known; but defective vision is one of the less familiar forms, and so I take the opportunity to direct your attention to this subject; at the same time reporting a few cases, which may prove of some interest.

This special form of functional trouble, not due to alcohol or tobacco, is, by no means, a common one; this is especially true in regard to the cases of amaurosis; those of amblyopia and narrowing of the fields of vision being more frequently met with.

The onset of the disturbance is usually sudden, and generally follows some shock, either mental or physical. In attempting to examine the eye there is a spasmodic contraction of the orbicularis muscle which is increased on exposure to a

¹Read before the American Neurological Association, Boston, June, 5, 1895.

bright light, at the same time causing a sense of anxiety, profuse lachrymation, and a spasmodic closure of the lid of the eye. The globe itself does not present anything abnormal, except that in a certain number of cases one may find some anæsthesia of the cornea. (This was a marked symptom in one of my cases, Case IV). The pupils are equal and react readily and normally. The media, lens, vessels, and fundus are normal, so that the local examination does not lead to any knowledge of the pathological nature of the other symptoms which one learns from the patient. Question the patient, and she complains of defective vision, pain either ocular or supra-orbital, and great sensibility to light. There may be absolute loss of sight, generally in one eye, or only amblyopia and a reduction of the field of vision to a small area around the fixation point. Besides the above we find the local and general symptoms of hysteria, viz.: a circumscribed pain over the brow, a globular sensation in the throat, excitability and irritability of the nervous system, palpitation of the heart, a tendency to laugh and cry without cause, irregular, painful, or absent menstruation.

The following cases were referred to me by Dr. David Webster, and well illustrate the above objective and subjective symptoms.

CASE I. *Amblyopia and Contraction of the Fields of Vision. Vision Restored in Twelve Séances.*—Kate T., eighteen years of age, was seen for the first time on June 12, 1894, when the following history was obtained: She had always been nervous, but otherwise had had no trouble until the appearance of menstruation two years ago; then, during the first year she suffered much pain each month. For the past year menstruation has come on at irregular intervals, and has now been absent for two months. Within the last six months the patient has become very depressed and emotional, and she has also had two convulsive seizures of a hysterical nature. One month ago a brother committed suicide, and it was shortly after this that she first noticed failure of vision; at times becoming entirely blind; this latter condition only lasting a few seconds. Exam-

ination does not reveal any organic lesion of the nervous system. Any attempt to examine the eyes causes a spasmodic closure of the lids. Both pupils are moderately dilated and react normally. The vision of the right eye is $^{20}/_{xv}$, and of the left eye $^{20}/_{xl}$. Both fields of vision are very much contracted.

The fundus, media, and vessels are normal, nothing being found to account for the condition present. Two attempts to hypnotize the patient failed, but on the third trial she passed into a deep sleep, and suggestions referable to the conditions present were made. After seven séances, the fields were again measured and a marked improvement was found.

The treatment by suggestion was continued until August 15, when the patient was discharged with perfectly normal fields and vision fully restored.

CASE II. *Amblyopia. Contraction of the Visual Fields. Improvement after Six Séances.*—March 29, 1895. Charles T., aged twenty-eight, single; clerk. General health good up to eighteen months ago; then after some business troubles and excesses, he became depressed, nervous, and could not sleep. Six months ago he noticed that he was having periods of temporary blindness, these only lasting for a second or two. Three months later his vision became blurred, and this condition has remained up to the present time. He has never had any diplopia. Within the last month there has been more or less frontal and occipital headache, and lately he has become very emotional. Sometimes he gets confused and can not remember dates, otherwise his memory is good. The urine has been examined several times and always found to be normal. At one time he had herpes preputialis, and being told that it was due to a syphilitic infection, thought all his symptoms were caused by this disease.

Examination.—Stands well with eyes closed. Knee-jerks high but equal. Grasp of hands as shown by the dynamometer: R. $^{30}/_{xl}$; L. $^{40}/_{xxxix}$. Tongue straight; speech normal. Pupils equal, of medium size, and active. The ocular muscles thoroughly tested with prisms, do not show any degree of pa-

resis. The optic nerves and retinal vessels appear perfectly normal. Both visual fields are very much contracted.

There is no loss of color perception. The left side, including the cornea, is slightly anæsthetic, and he now states that he occasionally has a temporary feeling of weakness in the leg and arm of this side. Examination does not reveal the slightest loss of power: all the muscles are firm and react normally to both the faradic and galvanic currents. He was hypnotized without any difficulty, and the proper suggestions were then made. This method of treatment was continued for two weeks, resulting in a complete disappearance of many of the symptoms complained of. The visual fields were again measured, and though some improvement was shown, still there remained a certain amount of contraction.

On April 12, he stated he had been having more or less pain in his abdomen for several days, and that this morning he had passed some white objects at stool. Upon examining these, they were found to be a number of the links of *tænia solium*. A mixture of castor-oil and filix mas was ordered, with directions as to diet, etc.; which resulted in the passing of two worms, many yards in length, including the heads. Three days later his eye symptoms had all disappeared, the visual fields were entirely normal, and have remained so up to the present time.

CASE III. *Monocular Blindness. Cure in Five Séances.*—Fannie T., aged thirty-eight, married. Seen November 23, 1892. She was perfectly well until one month ago, about which time she became depressed; could not attend to her household duties and had a number of crying spells. Three weeks later pain appeared in the left eye, accompanied by some blurring of vision, which gradually increased, and now for the past three days there has been complete blindness in this eye. No vomiting, diplopia, or vertigo. There is no history of rheumatism, malaria, or any serious illness, having always enjoyed good health up to the time of the present trouble. She had three healthy children and has had no miscar-

riages. Careful inquiry does not reveal any history of syphilitic infection. Bowels and menses are regular.

Examination.—There is a complete loss of vision in the left eye: she fails to recognize any object held before it, the right eye being covered. Vision in the right eye normal. Pupils normal in size and active: no ocular paresis. On exposing the eyes to a bright light there is a certain amount of photophobia. The ophthalmoscope shows nothing abnormal either in media, disk, or vessel. With the exception of a slight amount of anæsthesia of the cornea, there were no other sensory changes. The patient was easily hypnotized, and the necessary suggestions having been made, she was awakened after sleeping ten minutes. The right eye was then covered and the left again tested. Vision was about the same, but she volunteered the statement that there was less blur, and the pain had disappeared.

November 25. No change; condition the same. Vision again tested as before and with the same results. She complains of a good deal of pain in the left eye and face. I hypnotize her and suggest that she will have no more pain; that the rest will do her good and that she will now see. In fifteen minutes she sits up on the couch, and placing one hand over the right eye, recognizes a clock on the wall twelve feet distant, although she is unable to distinguish the hands or tell the time. A bunch of keys, a knife, and a silver half-dollar are named correctly at four feet. The pain is entirely gone.

December 7. Patient reports that she is now able to see much better, also that the pain has been absent since the last séance. She sees well at ten feet, but beyond this everything looks blurred. Séance repeated.

December 9. Has been perfectly well: no pain. Vision entirely restored.

CASE IV. *Monocular Blindness. Cure in Nine Séances.*—On September 12, 1894, the patient was referred to me by Dr. Webster with the following note: "I see no sufficient ophthalmoscopic reason for the loss of all but perception of light of this young woman's left eye. If you can find no lesion of the

brain to cause the blindness perhaps you can restore the sight by hypnotism as you did before."

Mary C., aged eighteen, married. The patient is an Armenian and can not speak a word of English, but her physician is present and acting as interpreter, the following history is obtained: Has been married five years; two children and no miscarriages; is now nursing an infant eight months old. Was fairly well up to the past month; during this time she has become depressed, emotional, and has often complained of a lump rising in the throat. A few days ago she had some head-pain, and with its appearance she noticed failure of vision in the left eye, and now the patient can not distinguish any object at any distance far or near, but she can make out the difference between light and darkness. She is poorly nourished and anæmic. Mucous membrane of lips, gum and conjunctivæ pale. Both pupils moderately dilated, the left not reacting as actively as the right. Fundus entirely normal. Failing to find any evidence of organic trouble, the diagnosis of a functional amaurosis was made and I decided to try suggestion for its relief. The patient not being able to understand English, I was not successful in the first attempt to hypnotize her; but through the aid of Dr. Aterian I learned the proper Armenian words necessary for the purpose and was successful at the third séance in obtaining a deep hypnotic sleep. Complete recovery took place in nine séances.

CASE V. *Monocular blindness. Unimproved.*—This patient had been under the care of Drs. Boynton and Palmer at the Ophthalmic Hospital, and was finally referred to Dr. Webster, through whose kindness I saw the case on February 4, 1895. Although there does not seem to be any doubt in my mind as to the trouble being a functional one, all methods of treatment have proved ineffectual. The following is the history:

Agnes L., fourteen years of age; single. She was perfectly well up to one year and a half ago; about this time she fell on the ice, striking the back of her head. She was much frightened and jarred, but did not vomit or lose consciousness. Menses appeared for the first time shortly after this, but have

never been regular, two months having now elapsed since the last period. Two months after the accident above referred to, the patient commenced to have headache, chiefly frontal, but sometimes in occiput and back of neck. On May 5, 1894, she came under the care of Dr. Boynton, at the Ophthalmic Hospital, for dimness of vision. Examination revealed almost total loss of vision in the right eye, without any change in the fundus, vessels, and disk; all being found normal. While in the hospital she had two epileptoid attacks, hysterical in character, and she also had frequent crying spells. Thorough treatment with strychnia, glonoin, iron, and the valerianates caused no improvement.

Examination.—There is a complete loss of vision in the right eye. Left vision is $15/cc$, brought up to normal with proper glass. Field much contracted in all directions. In a moderate light, both pupils dilated, the right being a little the larger. Reflex through the right retina not as good as through the left. When one illuminates the left retina, the right pupil does not remain contracted as long. With direct illumination the reaction is about the same. There is a marked loss of sensation of the cornea of the right eye, but no anesthesia of face, body, or extremities. The patient recognizes colors readily. The knee-jerks are exaggerated but equal. The question of simulation was considered, but repeated tests by prisms and other means gave negative results. Treatment by means of drugs having failed to change the conditions present, hypnotism and metallo-therapy were tried, but both failed to influence the patient in any way.

Prognosis and Diagnosis.—From the facts brought out in the above histories, we see that an amblyopia, or amaurosis from hysteria, may be slight in form and transitory in duration, or very severe; sometimes tardy in its progress and prolonged in its existence. If the condition should persist for any length of time and an alteration of nutrition or any morbid formative process be set up by the prolonged functional disturbance, then it is probable that finally the condition would change into an amaurosis from inflammation and congestion. The latter

condition; I now believe, is taking place in Case V., which illustrates well this type of the disease.

The diagnosis is based on two points, viz.: the absence of any demonstrable changes in the eye, and the lack of that agreement between the individual symptoms constituting the disturbance of vision which under other circumstances they would exhibit. Persons whose visual fields are unusually contracted still move with perfect security, without stumbling, in a space which is not well known to them. The only difficulty in diagnosis exists in those cases where a line must be drawn between true simulation and a hysterical blindness, that is, one having an actual existence in the imagination. It is not that they will not, but they can not will. The retina receives the impression, but through some fault of the higher cortical centers, perhaps by inhibition, the patient remains unconscious of it.

Treatment.—Besides the measures usually recommended in the treatment of these disorders—the internal administration of strychnia, iron, etc.—I wish to urge the trial of hypnotism, and I do not do this from any optimistic point of view.

A great many of us are prone to look upon this entire subject as either belonging to the domain of quackery, or believing that it requires some special power hesitate to take advantage of this method of treatment. The time has now passed for any such argument, and any physician who would take the trouble to study the subject would obtain satisfactory results in a certain number of cases. The manner of procedure in producing hypnosis is given in detail in current literature, so that it does not seem necessary to dwell upon this part of the subject here, except to state that the fixation method is the one generally employed.

From the results obtained in the cases just submitted, the following conclusions may be drawn, viz.:

1. We possess in suggestive therapeutics an important aid in the treatment of certain morbid conditions, but just how valuable this may be, can not be estimated until it is more generally used and the results reported.

2. The results of this method are sufficient to stimulate the profession to further use of it.

3. Instead of waiting and trying other methods first, thus allowing the disease to exist for a certain time, I would recommend the trial of hypnotism in the first place. Two of the cases already reported had been treated by other measures for some time without success.

4. The use of hypnotism by the intelligent physician, in the cure of certain morbid conditions, does not produce any bad effects, notwithstanding reports to the contrary.—*Medical Record*.

OBITUARY.

HENRY W. WILLIAMS, A.M., M.D. +

This eminent ophthalmologist and author, whose fame was not confined to this country, but extended throughout Europe, has been a conspicuous professional figure for many years. He was born in Boston, on December 11, 1821, and Boston continued to be his home during his whole life. He was educated in the schools of his city and prepared to enter Harvard College at the Latin School. His health, however, was so poor that he did not enter college. He took up mercantile pursuits instead, but these became distasteful to him and he soon abandoned them and began the study of medicine. He attended lectures at the Harvard Medical School and graduated in 1849. He then went to Europe for three years, following the various hospitals and the services of distinguished practitioners in Berlin, Heidelberg, Zürich and Paris. Much of his time was spent in the latter city, and it was here that he became especially interested in diseases of the eye. On his return to Boston he began the practice of medicine in all its various departments. Ere long, however, he drifted into his chosen specialty and was soon prominent as an ophthalmic surgeon. In 1864, the Boston City Hospital was organized and he was made its ophthalmologist, a position which he held till 1891, when by reason of ill-health, he resigned and was made consultant. In 1847, he was foremost in establishing the Massachusetts Medical Benevolent Society, which was designed for the relief of professional men and their families. He was afterward its President for many years. He was an active Fellow of the Massachusetts Medical Society from 1849 and was its President in 1880 to 1882. He was also an early member (1864) of the American Ophthalmological Society and

was its President in 1869, 1870, 1871 and 1872. Harvard, in 1868, conferred upon him the honorary degree of A.M. Three years later he was made an honorary member of the Phi Beta Kappa Society. In 1868, also, he won the Boylston prize for an essay entitled "Recent Advances in Ophthalmic Science." The year was made still more eventful to him by a call which he received from Harvard Medical School to the chair of Ophthalmology. This position he occupied for twenty-two years, after which, on account of ill-health, he retired. But on his retirement he endowed the chair generously.

He was the author of numerous writings, among which are: "Our Eyes and How to Use them"; "Recent Advances in Ophthalmic Science," and "Diagnosis and Treatment of Diseases of the Eye." His last public appearance of note was, last spring, before the American Academy of Arts and Sciences, of which he was a member, when he read an obituary of the late von Helmholtz.

Dr. Williams was a man of large stature and strong character. He was an excellent teacher, being clear, forcible and persuasive in his speaking. As an operator on the eye, he was ambidextrous, and is said to have had few equals. He achieved great success in his profession, and was an example worthy of imitation in his untiring patience, punctuality and conscientious devotion to duty.

Dr. Williams died at his home, 15 Arlington Street, Boston, June 13, 1895, after a very short illness. He leaves a widow, one daughter and six sons, three of whom are in the medical profession. One of the latter, Dr. Charles H. Williams, is well known as an ophthalmic practitioner and assisted in the revision of the enlarged edition of his father's work on diseases of the eye, one of the best manuals on the subject which has ever emanated from the American profession.

The remains of Dr. Williams were tenderly borne to their last resting place by his sons. Thus closes the chapter in the life of another one who has made invaluable contributions to the world and left an indelible impress upon this generation by his example and his works.

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ORIGINAL ARTICLES.

LYMPHANGIOMA CAVERNOSUM OF THE ORBIT, WITH AN ORIGINAL CASE.

BY DR. S. C. AYRES, CINCINNATI, OHIO.

Mr. C., æt. 53, was first seen May 15, 1894. At that time there was a well-marked proptosis of the right eye, which he said had been coming on for about three years. He had had no pain in the eye or orbit. He could count fingers at 3' but the inner field seemed to be more sensitive than the outer field. There was well marked optic neuritis. Motion of the eye was unimpaired. The diagnosis given was a probable sarcoma commencing in the apex of the orbit.

He has generally enjoyed excellent health and has been an active business man. Family history: His father died at 70 and his mother at 83; one sister living and in good health, and two sisters deceased—one from a malignant growth and one from child-birth. It was impossible to detect any growth around the rim of the orbit and it seemed evident that the

growth, whatever it might be, was located in the apex of the orbit and was pressing the eye directly forwards.

He was not seen again until November 25, 1894. In the meantime the tumor had grown very considerably, and the proptosis was very marked. The eye now stands about 8 mm. in advance of the plane of the left eye. Motion upward was limited and the eye diverged as if pushed out in the axis of the orbit. The optic disc was very considerably swollen, and vision was 0.2. Within the past few weeks he has had three severe attacks of pain in the head, and during them he had a tingling sensation in the right side and some delirium. There has also been at times a well marked mental hebetude. He became listless and sleepy, and lost interest in everything around him. When his wife would read to him, he would fall asleep or would lose connection in what was read or in conversation. He has had a large number of nasal polypi removed within the past year, but there was no evidence of any malignant growth in the nasal fossæ. The increasing exophthalmos and the mental hebetude and the attacks of pain in the head made him decide to submit to surgical interference for relief. There is no evidence of any growth in the orbit from palpation, nor was there any bruit or pulsation. He was told that an attempt would be made to remove the tumor and save the globe, if such was found practicable after its size and character had been sufficiently obtained in the first steps of the operation. The external rectus was first severed, leaving a stump on the sclerotic, so that it could be used for reuniting the muscle in case the tumor could be removed without sacrificing the eye. After getting an opening sufficiently large for me to make an exploration with my finger, I found that I had to deal with a large elastic tumor, which grew within the muscular funnel. The optic nerve was on its anterior surface and put greatly on the stretch. In view of the injury to all the ocular muscles and optic nerve from an attempt to remove so large a tumor, I decided to enucleate the tumor and globe together. The growth filled the bony walls of the orbit so closely that there was some trouble in detaching it, but this was finally accomplished and the optic nerve severed at the very apex of the orbit.

Macroscopically, the tumor presented a whitish appearance and was firm but elastic. The optic nerve was attached to it by bands of connective tissue. It measured 35 mm. in length; the diameter of the outer end was 22 mm., and that of the inner end 13 mm.



It is now five months since the operation and since then he has had no pain in the head, and the mental dullness and apathy have entirely disappeared. He takes an active interest in everything around him, and has regained his former activity. This has been one of the striking features of the case.

The microscopic examination was made by my friend, Dr. J. E. Griewe, whose letter I copy:

"DEAR DOCTOR:—I have examined the specimen which was removed from the orbital cavity, and I send you a few preparations stained with Boehmer's hæmotoxylin. I do not think there can be much doubt about the nature of the growth; and, while one would certainly be justified, from a macroscopic examination of the tumor, in coming upon the suspicion of echynococcus, yet there is nothing to justify the diagnosis microscopically. There are no hooklets, no characteristic membrane, etc. The new growth, if you may call it in the strict sense of the word a new growth, is characteristic of lymphangioma. Macroscopically you will notice that the preparation shows many small cavities. The tumor itself is composed for the most part of lymphoid cells, both large and small; the cavities are for the most part lined with an imperfect layer of endothelium, and within these cavities are numer-

ous lymphoid cells lying about loosely. There are no traces of bloodvessels, and there is no evidence of glandular formation. Lymph vessels are numerous and large, and these larger ones are lined with a perfect layer of endothelium. The examination agrees also with the clinical history of the case. I think that the trouble originated from an occlusion of one or more lymph channels causing an engorgement, which in the course of so long a time resulted in a mass of this size. My diagnosis is *Lymphangioma Cavernosum*.

Very sincerely,

[Signed]

J. E. GRIEWE."

The literature at my command shows only two similar tumors and probably a third. The first one is by Förster, in *Graefe's Archiv.*, vol. xxiv, 2, p. 107. The second is by Wiesner, *Graefe's Archiv.*, vol. xxxii, 2, p. 205, and the third by Dunn, *American Journal Medical Sciences*, 1894. There may be other cases of similar character, but I have not access to them. In consideration of the rarity of this disease, I have made translations from the above cases and have added notes from Ziegler and Michel

In Förster's case the tumor was situated within the funnel of the ocular muscles, as was mine, and was about the same length but broader. In this case, however, there was no mental disturbance and no pain. In mine the mental hebetude seems to have depended on the influence of the tumor. The tension of the tumor on the optic nerve must have been very considerable, as the nerve was found lying *over* its *anterior* surface. We cannot calculate from other statistics, as they are wanting, the probable or possible influence of such a stretching of the optic nerve on the brain, but in my case they seemed to stand to each other as cause and effect.

In Wiesner's case the tumor was located between the globe and the lower outer edge of the orbit, and was ovoid in shape and movable.

In Dunn's case, the patient was a leukæmic boy, eight years of age, and the tumors were above the eyes and at-

tached to the orbital arches, and there was no impairment of motion or vision.

There is an apparent inconsistency in the vision of the eye when examined in May or November. At the first date he could only count fingers at 3' and in November he had a vision of 0.2. I can only account for the difference by the variation of pressure on the optic nerve.

I. Graefe Saemisch, Vol. vi, Prof. R. Berlin, page 700, (quoted from *Förster, Arch. für Ophthal.*, xxiv, 2, p. 108). The only case reported up to date (1875) is reported by Förster.

"For the past ten years Nicholas B. has had a steady growing protrusion of the eyeball. Status: V.=movements of the hand at one foot. The skin of the lid is red, and the veins are varicose. The globe is strongly abducted, and with difficulty pressed backward. Movements of the globe are greatly interfered with, especially upward and inward. Palpation of the orbit gives one the sensation of a slightly movable, soft, in places nodular tumor about the size of a nut. Pulsation distinct, auscultation negative. Ophthalmoscopically: White atrophy of the optic nerve with but slightly filled vessels. Clinical diagnosis: Sarcoma fibromatosum orbitæ. Enucleation of the globe and tumor. Healed in six days. No recurrence. Macroscopical examination: Within the muscular funnel to the inner side and below the globe, was found a soft elastic tumor 37 mm. long and 35 mm. broad, which was enclosed in a capsule. On section the entire tumor showed itself permeated by spaces of various sizes, between which are broad bands of fine connective tissue. Microscopically, the inner walls of the alveoli are lined with endothelial cells. The walls themselves are formed by layers of connective tissue fibres, between which are spindle cells which are arranged concentrically to these cavernous spaces. The spaces contain numerous lymphoid cells, whereas the fibrillary walls show large quantities of elastic fibres and bloodvessels."

The clinical character of this tumor coincides most remarkably with that of a cavernous angioma. The slowness of

its growth, its painlessness, its seat within the muscular funnel, the retention of a certain amount of movement in all directions, its soft elastic consistence, which the specimen showed; in short, the only symptom which was lacking and which in this instance was not sought for is the swelling, to have made this a complete picture. *We must further not forget the important fact, that this even in itself rare form of tumor, a cavernous lymph-angioma, is found here for the first time in a tissue in which anatomically up to the present time no true lymph-vessels have ever been found.*

Owing to this being a single isolated case which up to date has been reported as occurring in the orbit, prompts the writer (Berlin) to give it thoughtful criticism. This would certainly not be possible if the microscopical examination of the alveolar contents had given us a completely convincing result. But he simply states: "The areolar spaces contained numerous lymph corpuscles." It certainly would have been of great importance to know whether there had been any other morphological elements present. The fact, as the author states, that the specimen was preserved for one and a half years in Mueller's fluid and alcohol before the microscopical examination was made, might certainly give us a reason for the difficulty in recognizing red blood corpuscles. The course seems to be an exceedingly slow one. Prognosis as regards the general condition is good. As a rule, as a result of pressure on the optic nerve or on the globe, or both, it leads to atrophy, even destruction of globe. Therapy: Extirpation.

Ziegler's Pathology, Vol. ii, page 304. Published 1891.

The angioma lymphaticum, or the lymphangioma, bears to the lymph system exactly the same relation that the angioma does to the vascular system. It consists principally of a dilatation of lymph vessel walls and the tissue between them. It is possible to differentiate between a lymphangioma simplex or telangiectasia lymphatica, and a lymphangioma cavernosum. We must still mention a third form, the lymphangioma cystoides. As one may see from the nomenclature, the configuration and size of these dilated lymph vessels varies greatly.

In the most pronounced change veritable cysts are formed. The contents of these spaces is mostly a light and clear, exceptionally a milky lymph. The condition is partially congenital, partially acquired. The congenital lymphectasies are found in various forms, as in the tongue (macroglossia), the dental arches, the lips (makrocheilia), in the skin (nævus lymphaticus), on the neck (hygroma colli congenitum), the labia majora, etc. It is not unfrequent to find the lymphectasia in the skin as an acquired condition, for example, on the thigh and on the scrotum. At times they form extensive, circumscribed, fluctuating tumors, (fig. 157). The ectatic and cavernous lymph vessels show thickened walls, and have their seat more especially in connective tissue and fatty tissue, and owing to extension of this cavernous development of lymph vessels over a large surface of the subcutaneous tissue of the skin, may cause an elephantiasis-like disfigurement of the part. Not infrequently the tissues which lie between this growth also undergo a hypertrophy. If these cutaneous lymphangiomata burst, a lymphorrhœa ensues. Not infrequently we find hyperplasia of the skin and other organs complicated by the estasia of the lymph vessels of the skin. In very exceptional cases chylangiomata of the intestinal wall and the mesentery have been found, and exceedingly seldom cystic lymphangiomata of the peritoneum.

Michel, Augenheilkunde, 1890, page 649.

"Cavernous angiomata and lymphangiomata may occur primarily in the orbit. They are most frequently found in the muscular funnel; less frequently between the latter and the bony wall. The latter is the case when the tumor has extended by growth, and this most frequently extends toward the roof of the orbit. The lymphangioma, it may further be stated, occurs in the latter years of life (about the 40th year) and may then occur primarily between the muscular funnel and the edge of the orbit. The symptoms at first may be very slight, simply causing a slight impediment to free movement, thus leading to diplopia. As the tumor grows the eye is pushed forward. The surface of the tumor, as a rule, is

smooth, sharply defined, moveable and compressible. Anatomically the tumor is made up of connective tissue, the alveoli are lined with endothelial cells; contents a serous fluid, containing lymphoid cells. *Lymphomata have been observed in the orbit at the same time with others in the lid, in leukæmia.*"

Thos. J. Dunn.—*Case of Leukæmia with rare lymphoid growths of orbits and parotid gland. The American Journal of Medical Science, 1894.*

Boy, 8 years, highly leukæmic. Growths in the orbits were crescentic above the eyes and not firmly connected with the lids, beyond the nasal side of orbits and extended to the external canthus, and were firmly attached to the orbital arches. Not painful. Considerable exophthalmus. Motions of eyes not much interfered with. Eyes healthy otherwise. Vision normal. No autopsy allowed.

The Lymphangioma of the Eye. B. Wiesner, *Graefe's Archiv.*, vol. xxxii, B. 2, page 208.

Case seen in November, 1885. History: Patient 43 years of age. Tumor of the left lower lid. Since past two months, diplopia. Status: Weak hypermetropia. Complete loss of function of right rectus inferior. Between globe and lower outer edge of orbit is an ovoid, movable tumor, about the size of a hazel-nut, hard consistence, smooth surface. *No exophthalmus.* Diagnosis: Fibroma of the orbit in tissue between the loose peri-orbital tissue and the rectus muscular funnel. Operated one week later, November 13. Incision made parallel to the lower orbital edge just below the same and the tumor, which was loosely connected with the periorbita and muscular funnel, was easily peeled out without loss of blood. Healed by first intention. Patient discharged on the fourth day.

(a) *Macroscopical examination:* Tumor 77 mm. long, 9 mm. high, 5 mm. thick. On incision a serous fluid escaped. Tumor showed a cavernous structure with relatively large and some smaller spots, showing a striking likeness to the cavernous structure of the corpus cavernosum of the penis. Tumor was covered with a thin fibrous sheath.

(b) *Microscopical examination:* Made partially on teased preparation, partly on sections stained with hæmatoxylin. The lax tissue around the tumor is concentrically arranged, rich in fat and bloodvessels, whose walls are hypertrophied. The fat is infiltrated with lymphoid cells. Accordingly the tumor is to be designated as a *Cavernous Lymph Angioma of the Orbit*. He then quotes Förster's case.

The Mode of Development of These Tumors.—They must belong to the class of new formations which take their origin from embryonal tissue. This follows from some unknown cause. We must assume in the foregoing cases that in the orbital tissues at some point, the development starts from (the lymph vessels have as yet not been demonstrated) the germ of the mesoderm or embryonal formative cells. In such a new growth all such tissues may be found which are destined to be developed from the mesoderm. That in any special case any particular type should predominate is not to be wondered at. In our case it assumed the character of a cavernous lymphangioma, which is rich in connective tissue, has many hollow spaces filled with lymphoid cells. The formation of bloodvessels keeps pace with the formation of connective tissue, which they nourish. In a later stage muscular fibres develop. The formative material has, however, been present from the beginning, consisting undoubtedly of a portion of the spindle cells interspersed in between the connective tissue framework. The arrangement of the muscular fibres is so far regular in that they arrange themselves in bundles; otherwise, they follow no regular type. The pressure which results from the growth of the tumor explains the inflamed condition of the vessels of the fibrous capsule, which appear to have developed from the cellular tissue of the orbit. The inflamed condition of the capsule is demonstrated by the hypertrophied walls of its bloodvessels and the lymphoid infiltration. The hollow spaces within the tumor are of very irregular form. This is the result of the outgrowth of processes, which meeting each other from opposite sides lead to the formation of

new spaces, and this going on will gradually lead to increase of the tumor.

"This tumor must be differentiated from the cavernous angioma, and in so doing I must confine myself to a clinical differential diagnosis.

"The cavernous lymphangioma has no characteristic clinical picture, so that we can show but indirectly by the clinical history that they are not cavernous angiomata. Based on a case of v. Graefe (*Graefe Saemisch*, vol. vi, p. 708) Berlin, describes the principal clinical features of the cavernous angioma. The spontaneous *increase and diminution of the swelling*, which can also be induced mechanically. Its full, elastic but at no point hard consistence, the almost totally intact muscular movements, its seat in fatty tissue, its extremely slow development, its painlessness and lastly the otherwise good condition of the patient."

Not a single one of the symptoms was present in this case (nor in Förster's case). The increase and diminution of the swelling was entirely wanting. Förster's case showed exophthalmus, nor was the consistence like that described by von Graefe. It was hard, which could not be the case in a tumor that was changing its size and elastic. Still it is very difficult to form a correct idea as to the consistence of a tumor, especially when palpating a tumor in the orbit. Then again there was not in our case a totally intact muscular condition, for we found impairment of the external rectus. In Förster's case, in which the tumor was inside the muscular funnel, the movement was interfered with in all directions. If this last symptom were always found lacking in cavernous angiomata, and in both the other cases was found present, this could be explained by the different anatomical character of the tumors. For the angioma is compressible; hence, any interference with muscular movements can be easily overcome, whereas in the lymphangioma this can not occur, hence the interference with the muscular action. The seat of the disease, the painlessness and general condition of the patient and general symptoms do not enter into the differential diagnosis.

The other objection which Berlin makes to Förster's case I do not consider as proven. The fact that this is an isolated case simply goes to prove that it is a rare affection and it is possible that some of the cases which have been described as fibroma of the orbit were of this nature. It seems strange that Berlin is not satisfied with the statement that "the spaces were filled with lymphoid cells and contained no other morphological elements," and again his remarks about the preserving value of Müller's fluid. Examination of specimens which had been preserved for many years in Müller's fluid demonstrated the fact, that it does preserve the red blood corpuscles beautifully.

Berlin seems to be of the opinion that lymphangioma can only occur where lymph vessels are present. I here once more point to the mode of development of these tumors, and will further add Wegner's theory. (*Langenbeck Arch.*, xx). Wegner arrives at the following conclusions:

(1) Lymphangioma may develop from already existing lymph vessels, which become dilated as a result of stasis, owing to closure of larger lymph vessels; hence, as a result of ectasia with hyperplasia. A case of this kind of so-called capillary lymphangioma has been described by Ben. Israel (*Ueber Lymphangioma, Mag. Dis.*, Würzburg, 1895).

(2) A second mode of development is not from preëxisting lymph vessels, but from newly formed lymph vessels, which are the result of an active proliferation of endothelium which already exists—homoplastic neoplasm.

(3) A third form is mentioned by Wegner, in which there is also a new formation of lymph vessels, which develop from connective tissue granulation tissue, which is the result of the dilatation of spaces which gradually take on the character of lymph-carrying spaces—heteroplastic neoplasm.

SOCIETY PROCEEDINGS.

SIXTY-THIRD ANNUAL MEETING OF THE BRITISH
MEDICAL ASSOCIATION, HELD IN LONDON
JULY 30, 31, AND AUGUST 1 AND 2, 1895.

SECTION OF OPHTHALMOLOGY.

[CONTINUED.]

A DISCUSSION ON THE DIAGNOSIS OF ORBITAL TUMORS.

I.—H. R. SWANZY, F.R.C.S.I., DUBLIN.

In the diagnosis of an orbital tumor there are three questions which present themselves—first, the main question, Is a tumor of the orbit present? secondly, Is the new growth confined to the orbit, or does it extend to neighboring cavities? and thirdly, Of what kind is the new growth? The diagnosis as regards any of these points does not often occasion much difficulty in advanced stages of the disease, especially where the growth occupies the anterior part of the orbit or protrudes from it. It is rather in the early and middle stages that difficulties in diagnosis are apt to present themselves, and in this paper attention will be mainly directed to those stages. It is not intended to indicate within the scope of this paper the diagnosis of some extremely rare tumors of the orbit, such as cysticercus, plexiform neuroma, and so on.

Of the signs by which the presence of a tumor is diagnosed in its early stages by far the most important, because the

most constant, is exophthalmos. In the earliest stages of a growth which commences in the deepest part of the orbit; there may be, it is true, no exophthalmos, while other symptoms—defects of sight, pain, loss of motion—may already be present, but when the growth attains to certain dimensions, or if, in the anterior part of the orbit, there be even a small tumor, the eyeball must be pushed out of its place.

It is not necessary that I should enumerate all the other causes of exophthalmos, but assuming that they have as far as possible been excluded, exorbitism at once renders the presence of an orbital tumor almost a certainty. An important diagnostic point in connection with the exophthalmos caused by a tumor is that its direction is almost always oblique and not straight forwards, for orbital tumors commonly tend to develop more along some one wall of the orbit than along the others, and hence the eyeball becomes pushed towards the opposite side as well as forward. In cellulitis, œdema of the orbital tissues, Graves' disease, and paralytic proptosis the exophthalmos has a direction straight forwards. Tumors growing from the apex of the orbit may in their early stages cause no obliquity of direction in the displacement of the globe, and some tumors do not do so even in an advanced stage of their growth, but these stages are exceptional. Tumors, too, situated altogether within the muscular cone, of which the most common are tumors of the optic nerve, need not cause any lateral displacement of the globe. Again the exophthalmos caused by an orbital tumor naturally increases in degree slowly and gradually, differing in this respect from exophthalmos due to most of the other causes, in which either a sudden or a rapid development of the exorbitism is the rule. While tumors are sometimes present in both orbits, especially lymphoma or lympho-sarcoma, yet it is infinitely more common for one orbit alone to be diseased, and hence monolateral exophthalmos is suggestive of orbital tumor.

Although exorbitism is almost an essential, and other causes being excluded, so conclusive a sign, yet we naturally seek for additional aids in a diagnosis of such grave import.

Of these the most valuable is often obtained by palpation in the orbit, provided that the new growth has come within reach in the anterior part of the cavity. In many cases, indeed, there is no difficulty whatever in recognizing the presence of an orbital tumor by this means, the sensation obtainable by the tip of the finger pressed into the orbit being very definite; but in other cases the evidence is not so clear, and the surgeon may have a reasonable doubt as to whether there is any abnormal resistance met with by the tip of the finger. By palpation, too, we may gain some knowledge of the position, extent, shape, and consistence of the tumor, and whether it be adherent either to the walls of the orbit or to the eyeball. It is important, when practicable, to compare the result of examination of the diseased orbit with the condition of the sound orbit, and this can be done to greater advantage if palpation of the orbits be performed simultaneously with a finger of each hand.

Derangements of vision are often, but by no means always, present in early and middle stages of the growth of an orbital tumor. Their occurrence depends frequently on the rapidity of the growth of the tumor rather than upon its size. In an early stage of a rapidly increasing tumor the sudden stretching of and pressure on the optic nerve may produce absolute blindness, while in another case, with an equal degree of exorbitism, but which has been brought on by a slowly growing tumor, vision may be unaffected by reason of the optic nerve becoming gradually accustomed to the change. Yet slowly growing tumors, which spring from the optic nerve or its neighborhood, or from the deepest part of the orbit, are competent, by direct pressure on, or by implication of the optic nerve, to cause serious loss of sight, even in an early stage, and with but little exophthalmos. Optic neuritis, and, later on, atrophy, are occasionally discovered with the ophthalmoscope. Diplopia is often present when the globe is at first displaced, but disappears when the exophthalmos becomes extreme or the vision defective.

Pain is a symptom sometimes, but no means always, pres-

ent in cases of orbital tumors. It is especially liable to be complained of when the growth is increasing rapidly in size, even though it may not have attained to great dimensions. The pain is then often of a neuralgic kind, and very severe, from the unaccustomed pressure on branches of the fifth nerve in the orbit. Certain sorts of tumor are more liable to be attended by pain than others, and the nature of the pain, too, is to some extent characteristic of the sort of new growth. To this I shall have to refer later on.

Loss of power of motion of the eyeball is a very common symptom in cases of orbital tumors. It is caused in some cases by the mechanical obstruction offered by the tumor, as a result of which motion of the eyeball towards the side of the orbit on which the new growth is situated becomes defective. In other cases the loss of motion is caused by stretching of the muscles from the exophthalmos, or by implication of them in the new growth, or by atrophy of their tissue, or by paralysis of the orbital nerves from pressure. When there is little or no loss of motion, while the exorbitism is marked, the conclusion may be drawn that the tumor lies within the muscular cone.

As regards the question whether the tumor is confined to the orbit, or involves one or more of the neighboring cavities, it may be assumed that it is confined to the orbit, unless there are symptoms or signs which point in the opposite direction, and in each case these symptoms and signs ought to be looked for. Tumors may either originate in one of these spaces and grow into the orbit, which is the more common event; or, originating in the orbit, they may at a later stage spread to a neighboring space; and it is often the history or progress of the case alone that can inform us which of these events has taken place.

Tumors which originate in the frontal sinus are usually either mucocoele or exostosis. Mucocoele of the frontal sinus frequently extends to the ethmoidal sinus and thence first encroaches on the orbit, pushing the eyeball downwards and outwards. Sometimes there is supraorbital pain, and sometimes, when the nasal meatus has become involved, there is discharge

from the nostril. The diagnosis in these cases is often obscure. Osteoma of the frontal sinus shows itself as a slowly-growing and densely-hard tumor almost free from pain, situated along the superior margin of the orbit, extending into the latter and pushing the eyeball downwards and forwards. It may subsequently extend to the orbital plate of the ethmoid. An error in diagnosis is, I think, liable to be made, sometimes when a tumor of the frontal sinus drives the outer table downwards and forwards, and when the latter gives to the touch the sensation of a bony growth. If the tumor also involves the ethmoid cells, the lachrymal bone is apt to be driven forwards, and the liability to the error I have mentioned is further increased. This was well exemplified in a case recently under the care of my friend Mr. Kendal Franks, where a sarcoma originating in the ethmoid cells had invaded the frontal sinus and the orbit, causing marked exophthalmos, yet no soft tumor could be felt in the orbit owing to the displacement forwards of the lachrymal bone, and downwards and forwards of the roof of the orbit, a condition which at first sight suggested the presence of an osteoma of the orbit. Bony growths originating in the orbit may invade the frontal sinus, and, whether originating there or in the sinus, are liable to produce absorption of the tables of the skull without any cerebral symptoms to indicate the occurrence.

Tumors of the ethmoid cells which encroach upon the orbit are likewise most commonly either mucocele or osteoma. Mucocele of the ethmoid cells presents itself in the orbit as a tumor gradually increasing in size on the inner wall of the orbit, and pushing the eyeball outwards and forwards. When it has grown sufficiently large, palpation of it will discover fluctuation. The source of error just now referred to, when the lachrymal bone is pushed in front of a slowly-growing tumor of the ethmoid cells, must be borne in mind. The sharp posterior edge of the lachrymal bone is easily felt for and found, and will direct the diagnosis into the right channel. Mucocele of the ethmoid cells encroaching on the orbit must also be distinguished from a dermoid cyst, but to this I shall return later

on. Osteoma of the ethmoid cells appears in the orbit as a hard round swelling at the inner canthus followed by a swelling of the cheek and displacement of the eye outwards and forwards. It is apt also to extend into the nasal meatus, driving the septum out of place, and to push the hard palate downwards, so that examinations of the nose and of the mouth should be made in aid of the diagnosis. Enchondromata and fibromata also sometimes spring from the ethmoid and extend into the orbit, and malignant growths may be met with here.

Tumors that spring from the body of the sphenoid bone, or from the antrum of the sphenoid, and encroach upon the orbit or rare, and the diagnosis of their origin in an early stage is practically impossible. Here, again, the examination of the naso-pharynx is important. It is stated (Stedman Bull) that an orbital tumor—which soon causes blindness, commencing in the temporal side of the field, and leaving the fixation point unaffected to the last, while at the same time a growth appears in naso-pharynx—is likely to be one having its origin in the sphenoid antrum. Bony tumors—osteoma, hyperostosis, and exostosis—polypi, and sarcomata are the growths most frequently found to originate in the sphenoid antrum.

Tumors of the maxillary antrum sometimes erode the floor of the orbit and grow into the cavity, driving the eyeball upwards and inwards. The breadth of the cheek is increased, the nose becomes pushed towards the opposite side, and the roof of the mouth is pushed downwards. Tumors of the antrum of Highmore sometimes cause pain in the teeth or in the region of the distribution of the infraorbital nerve, and there may be a dull pain in the region of the antrum. In some cases there is a discharge of pus or of blood from the nostril.

Tumors of the brain do not often invade the orbit, and then it is tumors of the middle fossa which gain access through the sphenoid fissure and optic foramen. The diagnosis of the origin of the disease can only be made if cerebral symptoms have existed prior to any sign of a new growth in the orbit. Tumors of the pituitary body may encroach upon the orbit by way of the sphenoid fissure, and are apt to be associated with

polyuria and bitemporal hemianopsia, which serve to aid the diagnosis. A more common event, although not in an early stage of the growth, is the extension of a primary orbital tumor to the brain either along the optic nerve, through the sphenoid fissure, or through the roof of the orbit by erosion of the bone. This occurrence is usually evidenced by the presence of cerebral symptoms, but cases have been met with where no such symptoms existed, although the orbital growth had encroached upon the anterior or middle fossa of the skull.

As regards the nature of the growth which may be present, it must be admitted that, in many instances, in the early stages of a deeply seated tumor we have to rest content with an indefinite or provisional diagnosis, unless an exploratory operation, with puncture or harpooning of the mass, is practicable, and such a procedure is often called for, in order to decide not only the nature of the tumor, but also its extent and origin. Yet there are symptoms which with caution may be utilized in this branch of the diagnosis, namely, pain, marked loss of motion, pulsation, consistency, and congenital origin.

Although pain is frequently present along with orbital growths of every sort, freedom from pain of a severe kind is much more common with benign than with malignant tumors, in which latter it is often complained of even from an early stage.

Loss of motion of the eyeball of some degree will be found with nearly every orbital tumor, especially towards the side of tumor, but marked loss of motion in every direction, or in nearly every direction, while the tumor may not as yet have attained a large size, is a sign very suggestive of malignant tumor. In a case which was quite recently under my care there was complete loss of power of the third and sixth pairs, the exorbitism was directly forwards and of moderate degree, and a soft new growth could be indistinctly felt with the finger on the floor of the orbit. After removal the great mass of the tumor was shown to be fat and dense connective tissue, but towards the center of this mass was situated a small pigmented

round-celled sarcoma. There was no pain in this case, and in that particular it proved to be an exception to the general rule in malignant tumors.

Pulsation of the growth, or of the eyeball which is pushed out of place by it, points to it being one or other of certain vascular tumors in the orbit, or, which is more common, in the middle fossa of the skull. In addition to this, in these cases we expect to find characteristic *bruits* which are perceptible both subjectively to the patient and objectively to the surgeon on auscultation of the orbit and skull, and there may also be a fremitus observable on placing the hand over the eyeball. But it must be borne in mind that pulsation may sometimes be found with malignant tumors which are rich in vessels, and with non-vascular tumors situated deeply in the orbit

If a tumor be congenital, this as a rule points to its being either an encephalocele or a dermoid cyst. Dermoid cysts, although always congenital, do not often grow to any size until the age of puberty or later, and may then for the first time give rise to troublesome symptoms. An encephalocele is situated most commonly in the inner angle of the orbit, and is a striking object from the moment of birth. It is a fluctuating, semi transparent, pulsating tumor, which disappears on pressure while cerebral symptoms are simultaneously produced. Occasionally an encephalocele becomes shut off from the cranial cavity so as to form a true cyst. Pressure on it does not then cause any cerebral disturbance, and the diagnosis may be less certain.

The consistence of a tumor is a valuable guide to its nature. All the bony tumors present, of course, the sensation of dense hardness to the touch, but there are some malignant growths of such hardness that it may not be easy to tell them from the osteomata by palpation, and an exploratory puncture becomes necessary in order to decide the point. The growth of an orbital osteoma is excessively slow, and pain is rare. In addition to the dense hardness of these tumors, their usually globular and somewhat nodulated surface, their immobility and the indirect connection with the walls of the orbit ascertainable

by touch, are the deciding points in the diagnosis. Certain malignant growths are so soft that false fluctuation may be obtained from them, and the erroneous diagnosis of a cyst or abscess be made, and here too an exploratory operation is in its place. True fluctuation suggests the presence of a cyst, usually a dermoid cyst, a meningocele, a mucocele proceeding from the ethmoid sinus, an abscess, or very rarely an echinococcus cyst or a cysticercus. The echinococcus cysts are usually associated with severe ciliary neuralgia. To obtain fluctuation, the best method is, with the tips of all the fingers of one hand placed on the protruded eyeball, to push it suddenly backwards to its normal position, while at the same time with the tip of the first or first and second finger of the other hand on the tumor the impact of the displaced fluid contents of the tumor is observed. It is as a rule less satisfactory to endeavor with one or two fingers of each hand placed on the tumor to obtain fluctuation, for the surface which can be reached is usually small, and moreover, the force of the pressure made on it is transferred largely to the eyeball and other moveable contents of the orbit, and, consequently, the strength of the impact on the finger of the other hand is reduced. Cysts, it should be remembered, are sometimes associated with both bony and malignant tumors, and may mask the main disease, which is not discovered until operative means are being used for removal of the cyst. Some dermoid cysts, the cholesteatomata, do not afford any fluctuation.

In respect of the diagnosis of sarcoma of the orbit in its many varieties, it has been stated by a distinguished writer (Berlin) on this subject, that "When we meet with a solid tumor with nodulated surface, which does not fluctuate, does not pulsate, is not compressible nor densely hard, does not seem to be in connection with the brain, and does not proceed from the eyelids, eyeball, lachrymal gland, optic nerve, or neighboring cavities, we may conclude that we have to do with a sarcoma of the orbit." Yet we are liable to errors, for many very vascular sarcomata are compressible and may exhibit pulsation, while myxosarcomata and cystosarcomata sometimes fluctuate.

Nævus of the orbit is almost always associated with nævus of the eyelids. It is soft and somewhat compressible. The tumor swells and the exorbitism increases, if the head be held forward, or if congestion of the vessels of the head be produced in any other manner. The motions of the eyeball are much impeded, and pain is rarely complained of. These tumors are congenital.

Tumors of the optic nerve, as von Graefe pointed out, are diagnosed by the protrusion of the globe being pretty much in the direction of the visual axis, with retention of the mobility of the eyeball, and of the normal center of motion. The consistence of the tumor is soft, there is absence of pain, and in an early stage loss of sight. The increase in size of the tumor is usually slow. Palpation under chloroform may discover a tumor which is in connection with the eyeball behind, and which extends back towards the optic foramen. The diagnosis of tumors of the lachrymal gland is mainly made from the position of the growth, and the direction of the dislocation of the globe produced by it.

In conclusion, it must be admitted that the diagnosis of orbital tumors, especially in respect of their nature and extent, and as to whether neighboring cavities are involved, must in many instances remain uncertain, until in the course of the operative measures undertaken for their removal the true state of things becomes exposed.

II.—PROFESSOR PANAS, M.D., PARIS.

PSEUDO-MALIGNANT TUMORS OF THE ORBIT.

When we look into the annals of science we are struck by finding a number of observations of exorbitism with tumor supposed to be malignant, in which the appearance of an intercurrent erysipelas or a medical treatment employed intentionally, or by chance, has had the effect of causing the disappearance of the tumor. We nearly always infer, and often wrongly, that the case was one of orbital syphiloma. Inas-

much as syphilis stands at the head of infectious diseases, it is certainly very often the cause, but as mercury and iodide of potassium have a marked action on other things besides syphiloma, we are not justified in inferring the existence of syphilis, by reason of the happy effect of treatment, unless there be other specific manifestations. Such unjustifiable inferences are still constantly repeated, as we may see by looking over the works that have appeared recently, among others those of Maracek,¹ Campana,² Galezowski,³ Haltenhoff,⁴ W. H. Hennebert and Coppez.⁵

In this last work the opinion as to the syphilitic nature is based upon the cure by the mixed treatment, and upon the existence of pharyngo-nasal cicatrices only, as are observed in cases of old ozænas outside of all syphilitic contamination.

The recent communication of Esmarch in the German Society of Surgery, 1895, does not appear to be exempt from valid objections. The author enumerates cases of sarcomas and lymphadenomas of syphilitic origin having yielded to the specific treatment. He cites no fewer than forty cases—quite a great number. He thinks that the diathesis can be acquired or inherited. The cranium is the seat of predilection, and there is rapid recurrence of the tumor after extirpation. The tumors in question give way on the contrary to the treatment by iodide of potassium, to the action of toxine, and upon the appearance of an intercurrent erysipelas. The histological examination of the neoplasm, showing the presence of granular tissue with patches of fatty degeneration and proliferation of the vascular walls, would have, according to him, a great diagnostic value.

This manner of interpreting the clinical facts, which is also the one admitted by Krause,⁶ of Altona, with regard to analogous tumors—among others one of the nasal fossa cured by

¹Wiener Klinik, 1886.

²Giorn. Ital. de le mal. veneree, 1871.

³Rec. d'Ophth., 1886.

⁴Ann. d'Ocul., 1889.

⁵Ann. de Dermat. et de Syphilographie, Mars, 1895.

iodide of potassium, of some value a few ago—does not hold good, since we are beginning to recognize that a whole category of tumors reputed malignant are distinctly independent of syphilis. We think that a number of neoplasms thought to be lymphomata, sarcomata, or syphilomata ought to be attributed to the dyscrasia produced by some toxins.

The infectious principals, microbes or toxins, act by means of the venous anastomoses and by the lymphatics, or after their penetration into the entire organism. According to this there would be quite a class of infectious tumors, the syphilitic being an example, but not the only one. From considerations of this order we were led to look upon neoplasms of the orbit, especially the symmetrical ones, in a new light, and that by clinical observation. The starting point was that of a patient whose history was related in one of my clinical lectures at the Hotel Dieu.⁷ He presented a double exophthalmia, simulating in all respects sarcoma, which was completely cured by the arsenical treatment in solution in the form of arseniate of soda. Iodide of potassium, on the other hand, administered by a colleague, had for effect to exaggerate the volume of the tumor, as also the exorbitism. The patient, a vigorous man of 35 years, was absolutely exempt from all syphilitic taint, but had been suffering for some years from a certain degree of ozæna accompanied by epistaxis. To explain the double exophthalmia with fixity of the eyeball, papillary stasis, and waxy chemotic ectropion of the lids we admitted a microbe infection of the cellular tissue of the orbit caused by the microbes of ozæna from the nasal fossa.

We asked ourselves whether cases of this order were not more frequent than is generally thought. An interesting fact to note was that the two tumors of firm consistence, had for principal seat the inner or nasal wall of the two orbits, causing bilateral divergent squint. Since that time we have been able to observe a young woman, not syphilitic, but affected with sarcomatous polypi of the left nasal fossa. These polypi

⁶Loc. cit.

⁷Semaine Medicale, January 23, 1895.

having been several times removed, an exophthalmia manifested itself in the left eye with marked external strabismus, and the operation demonstrated that there was no sarcoma of the orbit; but that the cellular tissue was indurated, with corresponding lateral masses of the ethmoid. On the other hand, histological examination of a fragment of the nasal polypi showed that these were composed of pure adenoid tissue in no way sarcomatous.

To explain what had occurred in the orbit we admitted that at a given time the repeated removal of the nasal polypi must have been accompanied by an infectious process which propagated itself towards the cavity of the orbit. Upon this supposition the patient was put upon an arsenical treatment, which ameliorated her condition and has preserved up to the present time the vision of the exorbitic eye.

Apropos of such interesting facts, we had the good fortune to confer with Professor Duplay and our colleague in surgery, Schwartz, and both related to us what follows: In the presence of a neoplasm of the two superior maxillary bones, occurring in a boy aged 15, well constituted and exempt from syphilis, either acquired or inherited, Dr. Schwartz, in consideration of the bilaterality of what he thought to be a sarcoma, and the young age of the patient, tried, before proceeding to the operation, the internal treatment with Fowler's solution. At the end of some weeks the tumors were completely resorbed, proving that they were not of a malignant nature.

The case of Professor Duplay concerns an adult Brazilian with a voluminous tumor of the iliac fossa presenting all the characters of pelvi-abdominal sarcoma adherent to the bone. Judging the case to be an incurable one, he prescribed the tincture of conium as a "moral medication," and to appease the pain. What was his astonishment to learn three or four months later from the patient's physician that under the influence of the conium, an old remedy reputed anticancerous and praised by Trousseau, the tumor had entirely disappeared.

Quite recently we were called in consultation with Professor Grancher by Dr. Kalt, to see a girl aged 10, well con-

stituted and absolutely exempt from all syphilitic antecedents, either personal or hereditary. There had been noticed in April, 1895, a soft tumor the size of a small nut, at the superior and internal angle of the right orbit behind the lachrymal sac. This tumor, preceded by pain in the frontal region, was adherent to the bone by a large base, and also to the internal rectus muscle, and offered the reactionary signs of an abscess. Dr. Kalt made an incision into it on the fourth day, which proved to him that the mass had the constitution of a neoplasm. Upon the examination of a small fragment which he had removed, he found it under the microscope to be composed of round cells recalling those of sarcoma. In spite of this constitution, and apart from all syphilitic manifestations, mercurial ointment and the internal treatment by the iodide of potassium were prescribed by common accord. Six weeks later the so-called sarcoma had been nearly completely absorbed. A peculiarity to note was that at the outset of the evolution of the tumor there had been for one day a flow of pus from the corresponding nostril. As the frontal sinus is hardly formed at the age of the patient (10 years), we wondered whether the case was not one of a point of ethmoidal labyrinthitis having caused the engorgement by infection of the adjoining portion of the periosteum and of the cellular tissue of the orbit which had been infiltrated with migratory cells. It is not astonishing then that the resorption was caused by the influence of iodide of potassium combined with mercury, and we do not attribute the affection on that account to a specific cause of which no trace could be found.

In the presence of cases of that order we recalled to memory those published by others under different titles with reference to the orbit. Who does not know of the celebrated case of General Radetzky, related in the treatise of Mackenzie, where a chronic indurated abscess of the orbit was taken by the ophthalmological celebrities of that time for a malignant tumor, and which ended in a spontaneous cure? We ourselves have observed a case of the same order in the service of Velpeau, who had been mistaken in his diagnosis up to the time

when the patient, a youth aged 14, was cured after evacuation of the pus. A deep exploratory puncture with the bistoury having proved negative and confirmed Velpeau in his error, which lasted more than three months. Professor Gayet⁸ observed the case of a man aged 70 affected with a double exophthalmia without any known cause. He thought that the symmetrical tumor of the two orbits should be considered one of lymphadenitis. Having made bibliographical researches, he thought to class his case with those published by Arnold, O. Becker, Leber, Reymond of Turin, and Ostwald. Delens also published in the *Archives d'Ophthalmologie*, 1886, a double orbital lymphadenoma which disappeared during an attack of cholera.

The question whether lymphadenoma could be regarded as of infectious origin appears to us the more certain, for the reason that we had under our care a young patient affected with lymphosarcoma of the pharynx, occurring after an attempt by a colleague to remove adenoid vegetations from the nasopharynx. That presumption became a certitude since P. Delbet made his communication on the experimental inoculability of lymphadenoma.⁹ On account of the importance of that work we give permission to give a summary of it.

The proof of the infectious nature of lymphadenoma is based on the reproduction of the affection from man to the dog by inoculation of pure cultures of a particular bacillus. It was a question of a woman with generalised lymphadenoma of the specially splenic form.

Having made cultures with the blood taken from the spleen with a Pravaz syringe, the experimenter inoculated dogs with massive doses of the pure colonies at varying intervals. The only dog that he sacrificed had been inoculated on May 16th, then on the 18th, and so on until June 15, when he was killed; half the injection had been made in the peritoneum, half in the cellular tissue. The animal having lost 9 kilos. began to diminish in weight at the rate of 2 kilos. in a fortnight. At the

⁸Revue d' Ophthalmologic, 1886 and 1887.

⁹Academie des Sciences, June 17, 1895.

necropsy the glands of the mesentery, of the meso-colon, the thoracic and the prevertebral glands, those of the right groin and of the axillary spaces were considerably hypertrophied. To be free from the objection that the polyadenitis might not be in any way specific, he made cultures with the glands of the dog, and he was able to ascertain the presence of the inoculated bacillus in a pure state, while it was not to be found in the blood of the animal. Delbet promises to publish a paper later on the complete biological study of the bacillus causing lymphadenoma.

Besides the tumors of the orbit, sometimes unilateral, at other times bilateral, those having the lachrymal glands for their primitive seat must be noted. There are several varieties caused by general infectious conditions, such as gonorrhœa, the eruptive fevers, influenza, mumps, and perhaps also syphilis. This peculiarity is that they are bilateral, and are accompanied with engorgement of the parotid and submaxillary glands. In a certain number of cases, as in that of one of our patients, the starting point had been some uterine trouble at the monopause, complicated with hæmorrhages from a fibromyoma of the uterus. We think that we have to do here with an infectious state of the organism, as after the engorgement of the lachrymal glands our patient presented a double plastic choroiditis. We have published quite an interesting case in the *Semaine Medicale*, June 23, 1895. The case was one of acute dacryoadenitis in an adult. In looking for a possible infection we were led to discover that there existed a tonsillitis; one of tonsils, yet swollen and secreting, furnished a pus full of streptococci.

We all remember the interesting cases cited by Eales and Jonathan Hutchinson,¹⁰ in which the cure was obtained by iodide of potassium. The patient of the last named author was an inhabitant of Calcutta who had come to London with his eyes exorbitic due to the swelling of the lachrymal glands. The parotid and cervical glands were also swollen.

¹⁰Oph. Soc. U. K., iv., p. 36, 1884.

From the facts and reflections contained in this paper let me be permitted to draw a certain number of deductions. If they are not yet very conclusive, they will have the advantage at least of fixing the attention of clinicians and will be, I hope, profitable to patients.

1. In the presence of a tumor of the orbit reputed sarcomatous, even should we be enlightened by the histological examination, we must think of the infectious origin and not have recourse to any operation until previous treatment has proved negative.

2. Among the means of treatment we possess, we must include mercury, iodine, arsenic, and toxitherapy as it has been attempted with erysipelas or the pure cultures of streptococci by Fenleisen,¹¹ Hoist,¹² and Ealey.¹² Lassar,¹⁴ Sprank,¹⁵ W. B. Johnson,¹⁶ Coley,¹⁷ and Repin¹⁸ have used by preference the streptococcic serum, which is less dangerous, and whose toxicity can be increased by the addition in the cultures of the micrococcus prodigiosus. The injections are made into the tumor, at a remote point under the skin, or in the veins.

3. The research of the point of origin of the infection (nose, sinuses, pharynx) and the bacteriological determination of the toxins which are the cause, contribute to confirm the diagnosis and to lay down the basis for a rational medical treatment. It is only after this that we can have recourse to surgical interference, which is often powerless in the so-called sarcomata and lymphadenomata of the orbit.

The discussion was continued by

DR. HILL GRIFFITH (Manchester) referred to a case of orbital sarcoma, accompanied by an unusual amount of inflammatory action, in which the growth closely enveloped the

¹¹Das Erysipel, Berlin, 1893.

¹²Ann. de l'Inst. Pasteur, p. 243, 1888.

¹³Amer. Journal of Med. Sciences, May, 1893.

¹⁴Deutsch. med. Woch. N. 29, 1881.

¹⁵Ann. de l'Inst. Pasteur, p. 883, 1892.

¹⁶New York Med. Rec., November 17, 1894.

¹⁷Amer. Journal of the Med. Sciences, July, 1894.

¹⁸Revue de Chir., p. 465, 1895.

whole eyeball. He asked if anyone had thought it advisable in cases of exophthalmos, without other symptoms, to divide one or other rectus tendon, and explore the deeper parts of the orbit.

PROF. FUCHS (Vienna) had observed a case of rhinoscleroma of both orbits, which had extended from the nasal cavity through the apex of the orbits. The most striking feature of the case was the early onset of immobility of the eyes.

DR. ARGYLL ROBERTSON wished to support the view expressed by Professor Panas; that cases which presented every symptom of organic tumor of the orbit could still be cured by medical treatment.

MR. NETTLESHIP mentioned a case of single proptosis, with hypertrophy or semisolid œdema of the tissues in the corresponding temporal fossa, which had been perfectly stationary for the last five years.

MR. SPENCER WATSON narrated a case in which double proptosis was cured after the removal of both inferior turbinal bones with other nasal growths.

MR. ADAMS FROST spoke of a case of a patient who presented symmetrical tumors in both lachrymal glands, one of which was excised and found to be small round-celled sarcoma, the other recovered under iodide of potassium.

[TO BE CONTINUED.]

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

Thursday, June 13, 1895. D. ARGYLL ROBERTSON, M.D., F.R.S.E., President, in the chair.

* *

OPHTHALMIA NODOSA.

This paper was read by Mr. Lawford. The disease was one to which the name ophthalmia nodosa was applied by Sæmisch, and which results from the penetration of the tissues

of the eye by the hairs of certain caterpillars. Mr. Lawford's case occurred in a lad, into whose right eye the foxmoth caterpillar (*Bombyx rubi*) had been thrown; this was followed by severe and protracted inflammation, which lasted with intermissions and remissions for six months, and ultimately subsided, leaving the eye little, if any, the worse. Two hairs were removed from the lower part of the conjunctiva, but none were discovered in the deeper tissues. The previously recorded instances of this disease, some eight or nine in number have all occurred in Germany, and in those cases in which it was possible to determine the kind of caterpillar, the larva of the pine-moth (*Bombyx pini*) or of the foxmoth (*Bombyx rubi*) was the one which had caused the ocular lesions. In most cases the caterpillar had been thrown at the patient by a playmate or companion. The clinical features of the disease are inflammation of conjunctiva, infiltration of the cornea, and generally severe iritis or iridocyclitis, with opacities in the vitreous. The development of small firm grey nodules in the conjunctiva, episcleral tissue, or iris has been noted in every case, and examination of these nodules microscopically reveals a structure very closely resembling tubercle, with numerous giant cells, and in the center a section of a hair. In several cases sight has been seriously and permanently damaged, generally by blocking of the pupil, but in no instance has total blindness resulted. The disease has always occurred in country folk and usually in children. One case is reported to have commenced in June, all the others in August, September, or October. Mr. Lawford described the varieties of caterpillar which are known to have given rise to this disease, and discussed the methods by which the lesions might be produced, expressing the opinion that the affection is probably toxic in origin, the poison being contained in the hairs, which in some caterpillars are connected at their bases with glands.

MR. HARTRIDGE suggested that the prolonged irritation might more probably be due to the migration of the buried caterpillar hairs than to the introduction of a poison at the time of the initial lesion.

MR. DONALD GUNN referred to a report, for the truth of which he could not personally vouch, that our troops in India are liable to inflammation of the eyes supposed to be due to the smooth-skinned green caterpillar crawling over the surface of the eyeballs while the men are asleep.

In reply, Mr. Lawford said that migration of the caterpillar hairs was supposed to take place only for a short time; the hairs then became encapsuled, and remained stationary until disintegrated. Moreover, the inflammatory symptoms were referable chiefly to the iris and ciliary body, even though there was usually no evidence to show that these structures had been penetrated by the hairs. As to the disease referred to among the troops in India, it must be of a nature quite different from ophthalmia nodosa, as the latter only occurred after forcible penetration of the hairs.

* * *

NINE CASES OF CHANCRE OF THE EYELIDS AND CONJUNCTIVA.

Notes of these cases were read by Dr. Snell. The situations of the chancres were as follows: two at the internal canthus, one at the external canthus, three on the upper eyelid, one on the lower eyelid, one on the ocular and one on the palpebral conjunctiva. Three of the patients were as young as $2\frac{1}{2}$, 4, and 11, and the others were aged 20, 21, 28, 29, 30, and 55. The number of chancres on the eyelids or conjunctiva recorded in the *Transactions* of the Society were so few that it appeared as if his experience was altogether exceptional. He thought, however, it was possible that the true nature had not, perhaps, always been suspected. Bulkley gave the proportion to all extragenital chancres at 4 per cent. Generally the diagnosis was not difficult. In all his cases induration of the pre-auricular gland was present, and in some cases of the sub-maxillary glands also. The induration of these glands should suggest the specific character of the lesion. There was difficulty, as was usual in such cases, in ascertaining the exact mode of infection. One was assumed to have been occasioned by a scratch from a syphilitic infant the girl was nursing; in

another, the mother and her baby were syphilitic, whilst in a third both father and mother were so affected. Two were playmates, one of them coming under treatment shortly after the other; another was an inmate of a lodging house where four towels sufficed for eighty people.

MR. MARSHALL had watched a case at Moorfields somewhat resembling Mr. Snell's. The patient was a man, aged 20, who had an ulcer which did not yield to treatment till anti-syphilitic remedies were used.

MR. HILL GRIFFITH thought the chief interest of this class of cases lay in the diagnosis; until the secondary eruption appeared it was difficult to make a positive diagnosis. The two things with which it was likely to be confounded were: (1) A vaccine pustule, which occurs accidentally more often than is supposed; and (2) a tuberculous ulcer. He thought that the local inflammation resulting from vaccine pustule was usually more intense than that following chancre of the lid.

DR. BRONNER had seen eight or ten of these cases. He suspected that they were not so rare as was generally thought; the subjective symptoms are often slight, and patients do not come to the hospital for advice till it is too late to recognize the true nature of the sore.

* * *

CARD SPECIMENS.

The following were the card specimens: Mr. H. Secker Walker: (1) Sarcoma of the Iris; (2) Epithelioma of the Cornea and Conjunctiva; (3) Coloboma of the Iris and Choroid. Mr. Devereux Marshall: Cystic Sarcoma of the Ciliary Body. Mr. Morton: Microscopical Sections of Tumor of the Face. Mr. J. B. Lawford: Peculiar Colored Deposits in Crystalline Lenses. Mr. H. Work Dodd: Congenital Pigmentation of Retina. Mr. Silcock: (1) Congenital Anterior Synechia; (2) Tuberculosis of Eyeball Recovering. Mr. Nettleship: Case of Retinitis Proliferans. Mr. Doyne: (1) Case of Acromegaly; (2) Degeneration of Retinal Arteries. Dr. Beever: Case of Ophthalmoplegia Externa.

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EDITORIAL NOTICE.

Messrs. J. H. Chambers & Co., who have been the publishers of the AMERICAN JOURNAL OF OPHTHALMOLOGY since its inception, herewith announce to its patrons that they have transferred their interest in the Journal to its Editor, Dr. Adolf Alt. They bespeak the goodwill of every one concerned for this gentleman, and thank the profession for the courtesies shown and the support given them.

All moneys due from subscribers for 1895, and prior thereto, should be paid to

J. H. CHAMBERS & Co.,
2940 Locust Street,
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The undersigned shall, with the January number of 1896, assume the sole ownership and control of the AMERICAN JOURNAL OF OPHTHALMOLOGY.

Communications, exchanges, books, reprints and payments, from this date, should be addressed to Adolf Alt, M.D., 3036 Locust Street, St. Louis, Mo.

With great diffidence this Journal, as the pioneer of ophthalmic journalism in the West, was started by me twelve years ago, with the aid of Messrs. J. H. Chambers & Co., to whom my thanks are herewith cordially acknowledged.

The Journal, despite of contrary prophesies, has not only succeeded in remaining alive, but it has gained a firm footing and is, I think, a factor in ophthalmic literature.

This is particularly due to the support of its contributors and collaborators. I herewith not only acknowledge my thanks to them, but venture to hope that they will henceforth remain as loyal to the Journal as in the past.

The change, which brings the whole management of the Journal under one head, can, I think, influence it only in a beneficial way. With this chief alteration will be combined other changes calculated to advance it in every respect, which our readers will notice in the January number.

ADOLF ALT.

ORIGINAL ARTICLES.

A CONGENITAL TUMOR CONSISTING CHIEFLY OF MUSCULAR AND NERVE-TISSUE.

BY ADOLF ALT, M.D., ST. LOUIS, MO.

In the July, 1895, number of this Journal, Dr. Jennings reported a case of Congenital Rhabdo-Myoma of the Orbit, which appeared to be an unicum. I have, however, since seen that Ziegler mentions such tumors in the orbita, and the occurrence of muscular-tissue is mentioned more in detail in an article by B. Wiesner (*Graefe's Archiv*, Vol. xxxii, B. ii, pages 208 and 209).

The following case fell into my hands very soon after having seen the specimens of Dr. Jennings' case.

J. L., an otherwise apparently healthy boy, of 11 years of age, had had typhoid fever last winter. Ever since his recovery a swelling under the left upper eyelid has been noticed. This swelling gradually increased until a nodule was seen to protrude from the orbit, to press the eyelid forward, and to interfere with its movements.

When first I saw him, on November 19, the left upper eyelid was elongated, hyperæmic and slightly œdematous. No fold was visible in the skin, and the drooping lid covered a large part of the pupil. At the middle of the upper orbital margin a slight prominence was seen which, on palpation, proved to be due to a roundish, solid tumor, lying behind it, which had about the consistency of cartilage. This tumor

evidently grew from within the orbit, as the eyeball was somewhat pressed down by it. It but very slightly could be moved on the periosteum. Its size did not change, when the boy stooped, held his breath, or coughed. It was painful on pressure.

As it was the most probable thing that the nature of this tumor was that of a periosteal sarcoma, I advised immediate removal.

On November 22, I performed the operation with the assistance of Drs. Jennings and Nelson. The tumor reached into the orbit for about one inch. It was so firmly adherent to the periosteum that I had to remove some of the periosteum with it, and also attached to the levator palpebræ superioris. Its thickness was that of a common lead-pencil.

The tumor, having been hardened in alcohol, was examined in a large number of sections. Its more superficial parts consist of almost nothing but striated muscular fibres. These muscular fibres are mostly not quite as thick as normal ones, some of younger date are very thin, and are mixed together, as one would expect in such a tumor, in such a manner that a contraction of this muscular tissue could answer no purpose. In every section fibres are cut at all angles, some in their length, some transversely and some at intermediate angles. These muscular fibres are held together by loose connective tissue, in which, furthermore, quite a quantity of fatty tissue is embedded. The whole tissue is pervaded by hyperæmic blood vessels whose walls are very thick and full of round cells, (the evidence of a more recent inflammatory process) which here and there, also, lie accumulated in larger clusters. This larger quantity of round cells in some sections is the only condition which might point to a malignant process. Some of these round cell accumulations look almost like tubercles, however, no evidence of a specific nature can be found. The round cell infiltration is, moreover, most pronounced in the center of the tumor.

In the deeper parts of the tumor the quantity of muscular tissue becomes less and gradually gives room more and more

to nerve tissue. The nerve fibres are also arranged in bundles which cross and recross each other at all angles, and in some places form large whirls. These nerve bundles sometimes lie between the muscular fibres in such a manner, that by their growth the latter have been squeezed aside and pressed firmly against each other.

As Wiesner states in his case of lymphangioma of the orbit, we certainly have in this case, also, to deal with a tumor, which has grown from some remnant of misplaced embryonal tissue. While in Wiesner's case the muscular tissue was, however, unstriped and of an early embryonal type, and consisted "of long, spindle-shaped, flat cells, which appeared elliptic in transverse sections, and had the well-known rod-shaped nuclei," in the tumor, here considered, we have to deal in the main with striped muscular tissue and with nervous tissue. Both forms of tissue are almost in a state of full development.

SOCIETY PROCEEDINGS.

SIXTY-THIRD ANNUAL MEETING OF THE BRITISH
MEDICAL ASSOCIATION, HELD IN LONDON
JULY 30, 31, AND AUGUST 1 AND 2, 1895.

SECTION OF OPHTHALMOLOGY.

[CONCLUDED.]

CASE OF ACUTE ORBITAL CELLULITIS FOLLOWING A DENTAL ABSCESS.

MR. H. E. JULER and MR. MORTON SMALE read notes of the case of a boy, aged 15, who was admitted to the hospital, having fallen from a van a few days before. He presented all the signs of acute orbital cellulitis. The eye was lost. The eyeball was excised, and free incisions made into the parts around, and much foetid pus escaped. The boy had complained of pain in the upper molar tooth; this was accordingly removed. An abscess at its root communicated with the antrum, and by an opening through the roof of the antrum into the orbit. After free drainage the boy recovered perfectly.

CARCINOMA OF THE BODY OF THE SPHENOID. COMPLETE BLIND- NESS OF BOTH EYES.

MR. H. E. JULER and MR. W. J. HARRIS read notes of a case of this description. The carcinoma was secondary to one of the breast, which had been removed two years before. The

first sign of the orbital affection was sudden blindness of one eye, without intraocular change; then followed proptosis, ptosis; and impairment of movement, going on to total ophthalmoplegia. The left eye followed the same course. The seat of origin of the growth found at the necropsy proved to be the body of the sphenoid.

A DISCUSSION ON THE QUESTION OF OPERATING IN CHRONIC GLAUCOMA.

INTRODUCED BY E. NETTLESHIP, F.R.C.S.,

Ophthalmic Surgeon St. Thomas' Hospital.

I think that it may be interesting both to ophthalmic surgeons and to those in other branches of practice to hear what practice the members of this Section follow in the treatment of chronic glaucoma: to hear whether experience is now more favorable to operation than it has been; whether there is an increasing tendency to leave cases of chronic glaucoma alone or to advise operative interference early.

In introducing the subject I have nothing new to propound; I desire simply to put before you for discussion a few of the many questions with which this difficult subject is beset.

There are many things about chronic glaucoma upon which we need spend no time to-day; we know that, speaking comprehensively, operations for chronic glaucoma are often negative in result and occasionally harmful; and we know that, even if nothing be done, the course of the disease is now and then so extremely slow (I mean ten years and upwards), that had an operation been performed early in the case, the operation could not have been credited with any share in the result. But such extremely slow cases are rare; and as chronic glaucoma when untreated commonly runs much the same course in both eyes of the same person, the effect of operation on one eye can often be gauged by the course the malady has already taken in the other.

1. I would ask first whether anything is gained by trying to distinguish between cases of chronic glaucoma in which the diagnosis admits of no doubt, and others, where, owing chiefly to the absence of decidedly increased tension, the diagnosis of a peculiar form of atrophy of the optic nerve with cupping of the disc is sometimes made? An optic atrophy, be it observed, occurring in the glaucoma period of life, unaccompanied by true color blindness, unaccompanied from beginning to end by the smallest indications of disease of the central nervous system, and lastly, linked by imperceptible gradations with typical chronic glaucoma. I myself believe that cases in which the disc shows well-marked glaucomatous cupping should almost without exception be looked upon and dealt with as glaucoma, whether demonstrable increase of tension and other common signs of glaucoma be present or not. I anticipate that in these, the simplest cases of "simple" glaucoma, the truly glaucomatous nature of the disease will sooner or later be established anatomically. Probably in the cases, the lamina cribrosa being very weak, yields to an increase of tension too slight to be detected by the finger. I am far from saying that the result of operating on such very quiet cases is as good as we could wish; but I venture to think that the habit of regarding them as something different from true glaucoma is undesirable, and may tend to induce in the surgeon an unduly hesitating attitude on the treatment of chronic glaucoma as a whole.

2. Another question: Is it true that iridectomy performed when the visual field is already lost nearly up to the center is often followed quickly by a further loss of field which engulfs the center and thus seriously damages visual acuity? And, if such rapid loss of field occurs after operation, is it more to be expected when the previous contraction was of the concentric type than when it took chiefly the form of a sector? My own experience on this point is favorable. I have had very few cases of quiet glaucoma in which the field became worse as an apparent result of the operation, whilst there is quite a number in which the field has remained the same

after as before. The risk of such further rapid loss of field as a consequence of iridectomy is probably greater *ceteris paribus* when the tension is much increased.

3. If we operate in chronic glaucoma, should the operation be done early, or, influenced by the fear of doing harm to a good eye, should we wait till the disease has made considerable progress, and there is but little to lose?

I am on the side of operating early and of operating first on the better eye if both are affected. Not only do we thus save more, but, and chiefly, the risk of displacement of the lens and internal hæmorrhage is certainly less in the early period, before marked atrophy of ciliary processes and iris has set in, and of course the hope of re-establishing the angle is better.

I can not help thinking that the fear, to a large extent unfounded, of operating early, and the negative and sometimes harmful results of operating late are responsible for not a little of the general disbelief or weak belief, in the benefit to be expected from operating for chronic glaucoma.

4. Another point: If we operate as early as possible in chronic glaucoma, we must, in practice, sometimes operate on cases in the prodromal stage before permanent loss of field and before much permanent change at the disc; cases in short, some of which would, if left alone, become acute, others more or less quiet and chronic. There can hardly be a doubt that if iridectomy were commonly performed in the prodromal stage the number of persons who become blind of glaucoma would be considerably lessened. The risk of an operation carefully done is very small; the prospects of immunity conferred by it very great.

The rule of operating in the prodromal stage must, of course, be applied with care; exceptions may be proper when a miotic is found to be efficient and the patient can be trusted to use it properly, and to report himself regularly. But I have a dread of letting such patients drift, as they are apt to do, into an acute outbreak or into permanent chronic glaucoma.

The rule for operating early in established simple glau-

coma must also, of course, be relaxed at times, especially for the very old, and those who on other grounds are bad subjects. On the other hand, early operation is, I think, strongly called for in glaucoma occurring in young subjects, because, size of cornea and lens apart, juvenile glaucoma probably often indicates an early tendency to weakness of the suspensory ligament and of the blood vessels. For the same reason I am inclined to keep the incision further forward in young patients, especially when the anterior chamber is of full depth, than in older persons.

Some parts of the iris in cases of glaucoma are often atrophic, and the practice now, I believe, usually followed of selecting for removal the most healthy looking piece, will no doubt commend itself to all.

I have throughout spoken of "operation;" personally I almost invariably employ iridectomy as the first operation, reserving sclerotomy as a second operation in occasional cases, and making it then opposite to the iridectomy. I performed primary sclerotomy, by Wecker's method many times some years ago, and gave it up. It will be instructive to hear other experiences of sclerotomy, whether performed by the subconjunctival method with a narrow knife, leaving a conjunctival and scleral bride (de Wecker), or with a lance knife (Snellen and others).

I have as yet tried Priestley Smith's scleral puncture as a preliminary to iridectomy only twice, both times in acute glaucoma with very shallow chamber. I have nothing to say against the proceeding, and it certainly made the iridectomy easier.

PROF. FUCHS (Vienna) had given up operation in cases of chronic glaucoma where there was no increase of tension. He always did iridectomy except when a fresh increase of tension came on after iridectomy when he did a sclerotomy.

DR. MEYER (Paris) agreed with Mr. Nettleship's propositions generally with the exception of the first one. He had watched such cases for many years, and had seen the cupping of the disc becoming deeper and deeper without sufficient

alteration of central or peripheral vision, and he did not regard them as cases of glaucoma. He always advised operation, whatever might be the diminution of vision or of the state of the visual fields. He always performed iridectomy, having found after serious trial that all that sclerotomy does, iridectomy does more surely.

PROF. GAYET (Lyons) considered sclerotomy as an operation done rather for the satisfaction of the surgeon than in the interest of the patient. He performed iridectomy from choice, but where this was dangerous he preferred equatorial puncture of the eye.

MR. CRITCHETT felt that they ought to be very grateful to Mr. Nettleship for having brought this question forward at a time when they had the advantage of the presence of so many of their eminent foreign colleagues. In this disease it was essential to remember the well-known text, "That thou doest, do quickly;" and he was in favor of early operation. He laid great stress on the advantages of a cystoid cicatrix, and said that any ophthalmologist who could invent a certain method of securing this condition would deserve well of his country.

MR. PRIESTLEY SMITH, referring to the question of diagnosis, said that a better agreement as to the sense in which the name "glaucoma" should be used was much wanted. To him, glaucoma meant a morbid process depending essentially on excess of pressure, while cases in which changes simulating those found in glaucoma arose from other causes than pressure, for example, physiological cupping supplemented by atrophy of the nerve were not glaucoma at all. He thought, however, that a more general use of the tonometer would render those exceptional cases rarer than they are now supposed to be. The tonometer has rendered him good service for many years. He hoped that the new instrument shown by Dr. Koster would prove an advance on his own, its principle was certainly good; but he was not quite sure of its practical applicability at present.

His own experience in the operative treatment of chronic

glaucoma appeared to him to justify the following conclusions:

1. It is right to operate at any stage of the disease so long as there is any sight worth saving, provided that the patient's general condition does not forbid an operation; and that the operation is the only means, but not a certain means, of avoiding blindness.

2. The immediate safety of the eye as regards the operation depends chiefly on the avoidance of injury or displacement of the lens, and deep-seated hæmorrhage. The making of a scleral puncture so as to slacken the eye immediately before the iridectomy is a valuable safeguard against injury of the lens during operation and displacement of it afterwards.¹ Scrupulous attention to the condition of the patient as regards sleep, bodily tranquility, and the action of bowels and kidneys are the chief safeguards against deep-seated hæmorrhage, but in certain cases this complication is inevitable.

3. The ultimate success of the operation depends largely on the formation of a permanent subconjunctival fistula which keeps the eye slack. The presence of such a fistula is shown by a bleb-like elevation of the conjunctiva over some part of the cicatrix. Iridectomy for glaucoma will be a more perfect operation than it is at present, when we have learned how to establish such a filtration scar in every case.

4. Permanent retention of vision is not always secured, however, even by an operation which fulfils the requirements already mentioned. The optic nerve, like other nerves, when once it has been reduced to a condition of partial atrophy, as in advanced glaucoma, is especially liable to undergo further atrophy when the nutrition of the nervous system in general fails. Anxiety, overwork, loss of appetite, and loss of sleep are potent causes of such failure. The treatment of glaucoma must therefore include, in addition to an efficient operation, careful and persistent attention to the health and habits of the patient.

DR. LITTLE (Manchester) believed that iridectomy arrested

¹See paper read at the Edinburgh Congress.

the progress of chronic glaucoma in a considerable number of cases. He thought that a cystoid cicatrix was rather a desirable thing to have after operation. After a fair trial he had given up sclerotomy as a primary operation, but he thought sclerotomy should be done where iridectomy had failed; and he preferred to do it in the coloboma. He did not think that operation was the cause of further contraction of the fields. He thought iridectomy should be done in the very early stage of glaucoma, in fact, during the premonitory stage, as he was quite certain that in spite of miotics these cases did develop sooner or later into glaucoma.

THE PRESIDENT (Mr. Henry Power) said the principle which had guided him had been whether the case was progressive or not. Many cases depending on mental worry were purely temporary, and could be cured by general treatment with eserine. In regard to scleral puncture, he could say with some certainty that it was useless in chronic glaucoma.

PROF. PANAS said that the treatment of chronic glaucoma by miotics ranked foremost: no fewer than four applications should be made daily, experiments having shown that the action of miotics does not last more than five hours. He preferred an ointment of vaseline, salicylate of eserine, and hydrochlorate of pilocarpin. The irritation of the conjunctiva by eserine was thus avoided, and the application could be continued many months. Where miotics were insufficient he performed sclerotomy, and where this failed iridectomy.

MR. SWANZY was in favor of early operation in chronic glaucoma; a certain amount of loss of sight was in many cases to be reckoned with, and for this reason he declined to operate in cases where the field was so contracted as to approach the fixation point.

MR. ADAM FROST, until recently, operated as routine practice in chronic glaucoma, but he had done so less often lately, owing to a suspicion that it did not arrest the disease. He had found preliminary scleral puncture useful in preventing failure of vision as a result of operation.

MR. J. G. MACKINLAY said that it was not advisable to

wait too long before operating in chronic glaucoma; it was necessary to make the incision very far back.

MR. TREACHER COLLINS had examined many sections of eyes with cystoid cicatrices, and had found that they were formed by a prolapse of a fold of iris into sclero-corneal wound. This prevented the sclero-corneal tissue from reuniting, and when the conjunctiva healed on the surface a weak spot was left in the fibrous tissue of the globe, which yielded to the pressure of fluid within.

MR. R. WILLIAMS (Liverpool) thought that sclerotomy was to be preferred to iridectomy, on account of its greater simplicity.

MR. G. WALKER (Liverpool) expressed his belief that it was essential in the treatment of glaucoma to correct errors of refraction, especially hypermetropia. He had abandoned iridectomy for glaucoma more than twenty years ago. In order to form a cystoid cicatrix he dissected up a flap of conjunctiva, and tucked it into the wound of the incision into the anterior chamber; he had found this efficacious.

ON THE UTTER NEGLECT OF THE EYESIGHT QUESTION IN BOARD OF TRADE INQUIRIES INTO SHIPPING DISASTERS.

BY T. H. BICKERTON, M.R.C.S.,

Ophthalmic Surgeon Liverpool Royal Infirmary.

Although the public memory is notoriously short, it will hardly be forgotten that on February 1st last a deputation from the British Medical Association and the Ophthalmological Society waited upon Mr. Bryce, who then occupied the position of President of the Board of Trade, to urge the adoption of more precise tests for eyesight in the examination of the mercantile, marine and railway employees.

It is no compliment to the gentlemen who formed that deputation, or to the carefully prepared case which they laid

before the Board of Trade, that the visual test question is precisely in the same position as it was then. Possibly the President of that overburdened department of Government—the Board of Trade—thought that he was doing well by the deputation when he gave it courteous hearing, and that nothing further would result from his neglect to take action upon this important matter. In fact, Mr. Bryce, in his reply to the unanswerable arguments brought to his notice, seemed to resent the mere suggestion that the Board of Trade had not pursued the most enlightened policy possible in dealing with the question of sailors' eyesight.

It may, perhaps, seem a little ungracious to criticise that reply at the present juncture: earlier action, however, on our part would have constituted a breach of the unwritten law of etiquette in such matters. It was promised us that the subject should receive careful consideration, and as the wheels of officialdom run proverbially slowly, a policy of passive waiting in the hope that the result of this promised "consideration" would ultimately be vouchsafed was practically the only line of action open to us. Mr. Bryce, too, it should be remembered, merely voiced the opinion of the permanent officials of the Board of Trade, and it is against their policy of inertia that my criticisms are directed, rather than at the statesman who was then their head and mouthpiece.

Mr. Bryce asserted that his "department had shown due diligence in dealing with the matter." At this stage of the color vision and eyesight question it is perhaps unnecessary to expose the baselessness of such a claim. It is well known that the "diligence" of the department to which is entrusted the safe guarding of the traveling community by land or sea has manifested itself, first in refusing to admit the danger of the color-blind factor, and subsequently, when compelled by facts to abandon this untenable position, it stubbornly resisting any effort which sought to eliminate visually afflicted persons from serving on our railways or in our mercantile marine.

The action of the medical profession in persistently pointing out the dangers arising from visual defect and suggesting

the adoption of remedial measures has been until quite recent times regarded in the light of mere faddism, and so long as discussions and recommendations were confined to the medical press the subject was a closed book to the public, and the Board of Trade treat the views of those competent to give an opinion with undisguised contempt. That the rights of the case were unknown to the public may be gathered from the fact that, though the dangers of employing color-blind men as sailors were first pointed out in 1855, a leading daily paper stated in 1888 that "too much fuss is made about the supposed deficiency." For such a statment the public press may rightly plead ignorance, but no such plea can be put forward by the Board of Trade. They were well aware of the researches of Dr. Wilson (Edinburgh), whose work on Color Blindness, published in 1855, will ever be a living monument to his labors; and they knew well of the efforts of Mr. Jabez Hogg, to whose admirable exertions, I believe, we owe the first Parliamentary return on Color Vision; of Mr. Brudenell Carter, of Cantor Lecture fame; of Dr. Brailey (London); and last, but not least. of Dr. Joy Jeffries, of Boston, U. S. A., whose work on Color Blindness has done more than any other to point out to the English-speaking people the dangers and the means of detection of that condition. But to all advice the Board of Trade turned a deaf ear, and I believe it was not until I enlisted Dr. Farquharson's assistance to direct Parliamentary attention to the question that the public began to be awakened to a due sense of the needless peril to which sea-goers were subjected from visually-afflicted sailors; and the Board of Trade to see that they had the public and not the medical profession only to deal with. For when once the vital importance of the matter was pointed out to the general and shipping press their voice has not ceased to make itself heard in the cause, and it has done incalculable good towards educating the nation to understand aright the risk which must ever accrue to lives and shipping property from color-blind and defective-sighted officers and lookouts.

As far back as December, 1877, Dr. Caldwell, surgeon on

board the historic Cunarder Russia, wrote to the *National Magazine* as follows:

"1. I hold that the quality of eyesight that was good enough to steer clear of the old sailing packet is by no means adequate to recognize surely and promptly the lights of the modern steamer, where the time for reflection is often limited to seconds.

"2. That more collisions occur through mistaking colored sidelights than almost all other causes combined."

The truth of the first statement, Dr. Caldwell goes on to remark, is almost self-evident, and will be conceded when one considers the increasing rate of speed as compared with the more leisurely progress of the days when steam was unknown. The history of accidents from collision, and the conflicting evidence with reference to the bearings of colored lights, as exemplified in our law courts, will, I think, sustain the latter statement.

So wrote Dr. Caldwell close upon twenty years ago, and it speaks volumes for the "diligence" which the Board of Trade has exercised over this subject that we, in the present year of grace, should still be urging the adoption of remedial measures to safeguard the public from dangers which were so pertinently indicated so far back as 1876.

Apparently the Board of Trade take credit to themselves concerning the Royal Society inquiry into the color vision question. It is well-known, however, that it was only after steady pressure, long continued, that such a step was practically forced upon the Board of Trade. The inquiry was a costly one, and its findings were quite in accord with the latest scientific teachings. But the Board of Trade, if we except their adoption of the Holmgren wool test, have done but little towards adopting the Royal Society's recommendations. Their action in thus seeking advice, and then failing to act upon it, is clearly evidential that the inquiry was wrung from them with the greatest reluctance. They were practically compelled by the influence of public opinion to order it, and their subsequent neglect of its suggestions lays the Board of Trade open

to the very serious charge of regarding the Commission in the nature of a sop which the united forces of the medical profession and the press compelled them to throw to the Cerberus of public opinion.

The official position on the subject of color blindness and its risks is the illogical one which assumes the absence of risk, because among the direct causes of collision, definite cases of the disaster being due to color blindness or to defective eyesight do not largely figure.

"It was certainly very remarkable," said Mr. Bryce, "that an exceedingly small number of accidents, he might almost say few or no accidents, at sea or on land had been so far traceable to this cause. He had for some months past carefully perused the reports of the courts of inquiry, and he had made most careful inquiries of the heads of the railway and marine departments, and had been assured that in scarcely any case had it been suggested, or so far as they knew could it be suggested, that defects of vision had been the cause of accidents."

This is the buttress behind which officialdom shelters itself. The Board of Trade requires that death and disaster shall first take place before they will take the necessary steps to eliminate color-blind and defective far-sighted subjects from occupying responsible positions on the decks and bridges of our merchant vessels. Mr. Bryce, instead of perusing the reports he alludes to for months might do so for years—for a lifetime in fact—and not find a single case in which the court finds that a vessel has been lost through the defective vision of some member of its or another vessel's crew. But if Mr. Bryce will deign to peruse the reports in question with an impartial mind, first dismissing the official view that the risk from color blindness and defective sight is a mere bogey, raised by the medical profession and believed in by the press, he will have but little difficulty in learning that many collisions occurring at sea by night are of an altogether unaccountable character. The atmosphere may be clear, the respective look-outs alert, so that the approaching vessels are duly signalled and

reported before the danger point is reached. In spite of all this, collision occurs. Through what cause? The Board of Trade maintain the cause may be anything save and except color blindness or defective sight. The preconceived official view on that visual defect quite precludes any suspicion that the disaster was due to such a factor. Common sense would say, why in such cases is not the eyesight of the survivors of such a catastrophe tested? Why, too, in cases where there is a glaring contradiction on matters of fact respecting the position of converging vessels, as manifested by their sidelights, does not the court insist upon the eyesight of the witnesses being tested? If such steps were taken I venture to assert that many an inexplicable disaster would be solved and many an apparent case of wilful perjury would be explained.

I challenge Mr. Bryce and the Board of Trade to point to one single case out of the many thousands that have occurred where, after collision, the Board have ordered an examination of the eyesight of the surviving officers and look-outs, and I submit that Mr. Bryce's misleading—not to use a stronger adjective—reply was not of the kind to be expected from the responsible Minister of a great public department. Rightly or wrongly, I felt at the time that his reply was an evasion of the positive evidence laid before him, and was directed towards screening the permanent officials from the charge of apathy and negligence. Unquestionably it deceived, with a few notable exceptions, the public press, and not for the first time was the public gulled into a false feeling of security. Little did I think that such a striking proof of their negligence and incapacity would so soon be forthcoming.

It might have been thought that the somewhat inexplicable cause of the Elbe and Crathie disaster would have suggested to the Board of Trade officials the advisability of testing the eyesight and color sense of the Crathie's look-out men. Apart, however, from the utter improbability of themselves deeming it advisable to sift this phase of the question, they even refused to do when asked.

Thinking that in such a lamentable catastrophe as this no

stone should be left unturned in the endeavor to trace to its true source the cause of the disaster, I wrote to the Board of Trade while their inquiry was pending, suggesting the desirability of examining the eyesight and color sense of such of the Crathie's crew as were on deck at the time of the casualty.

In response to my letter I received from the Board of Trade an autograph communication, of which the following is a copy:

"BOARD OF TRADE, WHITEHALL GARDENS, S. W. May 20, 1895.

"DEAR SIR.—I am directed by Mr. Bryce to acknowledge receipt of your letter of yesterday's date, and to state in reply that the question of the powers of vision will be carefully borne in mind in the Board of Trade inquiry into the cause of the collision between the Elbe and the Crathie.

"Yours faithfully;

"(Signed) GARNHAM ROPER."

A perusal of the above letter clearly conveys the impression that the Board of Trade intended—or rather, stated their intention—to examine the eyesight of the Crathie's look-outs. The inquiry, however, was duly held as announced, but the question of defective sight not being mentioned in the full reports appearing in the *Times*, I wrote again to the Board of Trade, asking for a definite statement of fact as to whether these look-outs had actually been examined or no. In reply I was honored with the following letter:

"BOARD OF TRADE MARINE DEPARTMENT,

" 7 WHITEHALL GARDENS, June 26, 1895.

"SIR—With reference to your letter of the 19th inst., asking whether the look-outs of the Crathie were examined as to their eyesight, and where you can obtain a copy of the evidence taken, I am directed by the Board of Trade to state that the witnesses were not examined as to their eyesight, and that the evidence of both sides showed that color blindness had nothing to do with the cause of the collision.

"I am, sir, your obedient servant,

"(Signed) INGRAM B. WALKER."

Color blindness or defective vision may or may not have

had something to do with the diaster; but I maintain most emphatically that, considering the awful nature of the catastrophe and the unsatisfactory nature of the evidence forthcoming, the Board of Trade should have tested the eyesight of the Crathie's look-outs, and that in the face of these letters their failure to do so constitutes a most serious dereliction of duty, and one which imperatively calls for Parliamentary action.

So much for Board of Trade persistency in escaping by any and every loophole from admitting that defective sight or color vision may be productive of maritime disaster.

A few words now on the subject of the Board of Trade's present regulations as to the proper time when the tests for color blindness or defective sight should be applied. Instead of being enforced before the articles of indentures are signed—and this is the proper moment—the tests only become compulsory on a candidate applying for a certificate of mate. They are thus only applied after a tedious apprenticeship has been completed, and when the candidate has, by following the sea, unfitted himself for success in other walks of life. What are the rejected ones to do? Stay on shore and starve, or go to sea? The public have an idea that the Board of Trade tests eliminate the visually imperfect from our mercantile marine. But is that so? The following letter shows that the only course open to the rejected is to go to sea, color blindness or defective sight notwithstanding.

It is the letter of a hardworking, sober, and industrious young fellow, a lifelong total abstainer, one who would under kinder circumstances have become an ornament to his profession. Failing, after being rejected for color blindness to get a birth on shore, even at the paltry pittance of £1 per week, he was literally compelled to go to sea as an A. B. at a wage of £3, 10s. per month. But let him state his own case:

"I signed my indentures on December 28, 1887, to Mr. S. J., Liverpool, for four years. I joined my ship at Cardiff, January 1, 1888, and finished my term of apprenticeship. I was also nine months over my time in the same vessel as A. B.

On arriving home I went to school to coach for second mate. I put in my papers October 14, 1892 (Friday), and was told I was color blind. At the advice of my late captain I took a short trip up the Mediterranean in a steamer belonging to Messrs. L. (the voyage occupies a month). Again my sight was tested and I failed in the 'greens,' but was told my sight in other colors was perfect. There was no hope for me to pass my examination, but at the same time there was nothing to prevent me going before the mast. I went away then in one of the Pacific Steam Navigation Company's Royal Mail Steamers, in which I have been seven voyages. During* these voyages I have never had any complaints as to my ability to keep a proper look-out. This I did in a fast steamer for over two years. In conclusion I may state that my only prospect now is to continue as A. B. for the rest of my days.

“(Signed) E. B. W.”

For many years past we have told the Board of Trade that their adoption of imperfect tests and regulations, has, by permitting the entry of color-blind subjects into the service, constituted a serious double offense. By such laxity, not only have incompetent men been foisted upon the public as competent ones, but the inhuman procedure has been followed of granting certificates of competency which, on the introduction of reliable tests, would be rendered valueless to the possessor, and would consequently entail loss of occupation, or, in other words, ruin.

This constitutes a serious blot on the fair fame of our Government. The color-blind officer has neither riches, influence, nor even a Parliamentary vote at his command; no redress is open to him; his only course is to quietly submit, without even an opportunity of protest, and he is consequently plunged into the depths of despair.

The present Government has a clean page before it. Humanity demands, and a sense of right dictates, that these poor men be not cast adrift. Their names and addresses are known to the Board of Trade. Let Government see that at the earliest opportunity shore births in Government offices be

offered to them, and thus, in some measure, they may be compensated for that loss of position and means of livelihood which, through no fault of their own, has unfortunately fallen to their lot.

If I am thought to be exaggerating the distress entailed, the recital of the following cases will carry conviction, where, perhaps, my mere statements would fail.

By the courtesy of Mr. J. Clark Hall, Registrar-General of Shipping and Seamen, I hold in my hands the returns of those men, failing to comply with the color and eyesight tests, from September 1, 1894, when the new tests came into force, to July 25, 1895. The numbers are truly appalling. No fewer than 76 failed on account of color blindness, and 80 for defective sight. Think for a few moments of what this means. Who can form the faintest conception of the depth of blank despair into which these poor fellows are plunged in an instant, victims of the crass ignorance, pride, and hardness of heart of gentlemen who, whatever they may be in private life, exhibit in their public capacity a callousness which cannot be surpassed, if paralleled, throughout the length and breadth of the land. I have seen men, strong in the pride of manhood, men who would face any danger, and who are a credit to any nation, utterly broken down on hearing that their position and livelihood—secure at one moment—are, through no fault of their own, swept away at the next.

I have already recorded the case of Captain Smith, who, after being at sea for twenty years, and in the possession of a Board of Trade master's certificate, was accidentally found to be color-blind, and was dismissed his ship. The ruin of his hopes and home—he was married and had three children—so preyed upon his mind that, though up to that time he had never had a day's illness nor consulted a doctor, his health gradually gave way, and his death occurred in a little over twelve months after his dismissal.

A still more distressing illustration is to be found in the case of Captain F., who, in April, 1895, was discovered, also accidentally, to be color-blind. A quotation from a letter re-

ceived from the house surgeon of the institution in which he was an inmate, in consequence of attempted suicide, will best describe his condition: "Early in the year the patient's certificate was endorsed 'color-blind,' in consequence of which he has been thrown out of employment. This has preyed upon his mind. He became sleepless and unsettled, and eventually tried to do away with himself by leaping into one of the docks. During his stay in hospital he was observed to be very melancholic, apparently taking no interest in his surroundings, and quite hopeless as to his future."

The bitter pathos of despair embodied in the above illustrations would be hard to parallel. Humanity and justice alike ask why the Board of Trade do not institute their tests so as preclude a color-blind or weak-sighted lad from embarking upon a sailor's life. The medical profession has long asked this question, the shipping and general press have long urged it; and, what is even more reflecting upon the criminal inaptitude of the Board of Trade, the committee appointed by the Royal Society and paid out of the public funds for the express purpose of considering this very subject, made it one of their most important recommendations, if not the most important of all. Why should the Board of Trade seek costly advice and then not act upon it? How long will the British nation tamely submit to such a manifestation of wilful perversity? Their examiners can produce many such harrowing cases of a life of promise blasted as the above; still the evil is unremedied, although the means is so easily available.

There is, too, another aspect of the question. The sight examiners have to test the candidates' knowledge of seamanship and navigation as well, and the new visual tests appropriate a great deal of time and entail much clerical work. The duties of the examiners are thus vastly increased. The work must be got through, however, and it is open to question if some section or other of the examination scheme does not suffer in consequence. On this ground alone, if on no other, a strong case is made out for expert examination. It is not the first time by a long way that the Board of Trade has been similarly

indicted upon this same question. The matter is one of national importance, rather than one which calls for the intervention of the medical profession alone. What is to be done to bring the Board of Trade to its senses? It is of little use interviewing the President of the Board of Trade, if like Mr. Bryce he is content to allow the officials of his department to continue the time-honored but criminal policy of refusing amendment. By such methods we may even do harm; for the press and the public are bound to pay more heed to his reply than to the statement of our case. What then, is to be done to make the British nation insist that the Board of Trade shall adopt a humane, an enlightened, and less criminally stupid policy on this important question?

Mr. Bickerton's paper was discussed by Dr. Caldwell, Dr. Farquharson, E.P., Dr. Egridge-Green, and the President (Mr. Henry Power). On the President's suggestion the following resolution was proposed by Dr. Farquharson and carried unanimously;

That the following points should be brought before the attention of Parliament:

1. Adequate tests should be compulsorily applied before a lad is apprenticed to the sea life.
2. The Royal Society's recommendations should be applied in their entirety.
3. That officers already holding certificates, and now, by the institution of adequate tests, found color-blind, should have shore births given them in Government offices.—*British Med. Jour.*

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

THURSDAY, NOVEMBER 14, 1895.

EDWARD NETTLESHIP, F.R.C.S., President, in the Chair.

THREE CASES OF EXOPHTHALMIC GOITRE WITH SEVERE OCULAR LESIONS.

This paper was read by Mr. Jessop. Case I. Married

woman, aged 40, had extreme proptosis of both eyes, never pregnant, menstruation always irregular, no enlarged thyroid. Operation of partial tarsorrhaphy on both eyes. Four days afterwards swelling of right conjunctiva, followed by crescentic ulcer of cornea and chemosis of left eye. Both eyes then ulcerated, and the corneæ necrosed notwithstanding active treatment. The corneæ were reduced to Descemet's membrane and perforated. Present condition, staphyloma of both corneæ and extreme swelling of the conjunctivæ. The patient is still alive but very weak. Case 2. A woman, aged 35, under Mr. Power. Extreme proptosis of both eyes, both corneæ sloughed. The right eye was excised. Patient became insane and died. Case 3. Woman, aged 24, under Mr. Vernon. Extreme proptosis; right eye sloughed, and was excised; left eye recurrent attacks of superficial corneal ulceration. Reference was made to 25 recorded cases, 7 males and 18 females. The results in the seven males were more severe, and included 4 deaths; the ages were between 38 and 56. Of the 18 females 2 died and 10 lost both eyes; the ages were between 18 and 52. The results of 3 cases of partial tarsorrhaphy in women were 2 lost both eyes and one recovered with good vision, though there was superficial corneal ulceration.

DR. LITTLE had never seen a case bad enough to need union of the lids.

MR. POWER had removed the eye in his case because of the continual pain and discomfort; he thought there might have been something behind the eye. He did not think the ulceration was caused by exposure, as it was not uncommon to see cases in which the eyes were never closed during sleep, and yet no ulceration took place.

DR. MACKENZIE DAVIDSON had had a case lately in which both corneæ were destroyed; the patient became insane, but afterwards recovered. In another case he did tarsorrhaphy, and the corneæ were preserved. In a third case the surface of the cornea was entirely destroyed.

MR. LANG had performed tarsorrhaphy in one case, but the stitches yielded, and both corneæ were destroyed. The stitches had had no harmful effect.

MR. JOHNSON TAYLOR suggested that the suturing should be complete and not partial, and should be done as soon as the cornea was affected.

MR. LAWFORD said in one case in which there was great proptosis with ulceration of cornea the lids were united at their centers instead of at the canthi; the result had been very good. He thought that union of the lids was a great safeguard.

THE PRESIDENT had had five cases of exophthalmic goitre with damage to the cornea. His impression was in favor of lid suture, but it should be quite firm; in cases where the suture had been imperfect he had seen bad results. He preferred wire sutures. One case was in a man, aged 52, with extreme proptosis and ulceration of one cornea. After suture the case did well. All cases were intolerant of any kind of irritation such as that produced by lotions or bandaging.

In reply, Mr. Jessop asked that all those who had had cases should put them on record, as there were very few reported cases, and the President's observation were interesting as showing the result of one form of treatment.

THE TREATMENT OF DETACHED RETINA.

MR. WRAY read this paper. The results of treatment in a case in which the distorted vision began in 1885 were demonstrated. The patient was seen for the first time in January, 1893. The left eye had barely perception of light, and the right eye contained a large detached retina involving about half of the fundus. The tension was decidedly raised, but the patient was and had been quite free from pain. As the other eye was quite blind from a penetrating wound, and had been so for many years, it was removed in the interest of the good eye. No more was seen of the case until January, 1895. The eye, under ophthalmoscopic examination, was found to contain a very large detachment, considerably larger than on the occasion of the last visit, so large in fact that although the media were clear, it was almost impossible to obtain a view of

the disc. The tension was still markedly raised and the cornea slightly hazy. Vision reduced to hand movements 4 to 6 inches. The case was subsequently exhibited at the Ophthalmological Society. On April 7, the patient was operated on by tapping the detachment, and a quantity of dark yellowish fluid evacuated. He was then put to bed, atropine was freely used, and the eye firmly bandaged. Daily injections of pilocarpin were ordered, but had to be discontinued on the third day, on account of the patient's intolerance of the drug. A week later ophthalmoscopic examination showed there still existed a detachment of very considerable size, though the vision was improved to fingers at three or four meters. After allowing a few days for the patient to recuperate, a second operation was done, with the result that vision improved to $\frac{6}{xxiv}$ in a good light, and the sight has fluctuated between that and $\frac{6}{xxxvi}$ ever since. The retina now appears in perfect apposition, and there exists, as is usual in such cases, a certain amount of choroido-retinal atrophy with pigmentation at the seat of the original detachment. The fields are much contracted, doubtless from the tension. The case proved that good may result from operative treatment, even in very severe cases of several years' duration. Little was to be expected from pilocarpin, and especially in elderly people and those suffering from cardiac disease. As the perfect rest treatment with atropine and bandage entailed confinement to bed for at least three to four weeks under almost insupportable conditions, and with the prospect of almost inevitable failure, it would seem better to operate at once, especially as the operation is almost free from risk under proper surgical precautions, and most surgeons do eventually operate after the failure of the simple treatment. As regards recent cases speedy re-attachment was necessary to prevent loss of function. If the subretinal fluid existed in any amount, several weeks would be required to obtain absorption and reapposition, whereas anatomical union was desirable, and probably the absence of this latter explains many relapses. In chronic cases, there will be even less tendency to rapid absorption, and therefore

it would seem reasonable to tap at once, so that the period of confinement to bed is spent in promoting an actual adhesion of the retina to the choroid. Cases unsuitable for operation are those where the macula is detached, where the vitreous contains numerous bands of contractile tissue, vascular membranes, large hæmorrhages, etc., and where the detachment is almost total, or the tension of the eye as low as — 3. A good result has been published in which the operation was done in a recent case with tension — 2. Clavelier's experiments proved that currents of 5 milliampères could be used for a minute without causing anything beyond transient opacity of the vitreous, and one operator published eleven cases in which he used electrolysis and obtained three ameliorations and two cures. As such currents cause only a transient opacity of the vitreous and leave no ophthalmoscopic changes behind, it is just possible that the beneficial results after electrolysis were due to leakage around the positive pole during the protracted period the needle was *in situ*. Constitutional remedies directed against gout, rheumatism, syphilis, etc., are slow in their action, usually depressing, and after long trial have not yielded results to warrant persistence in their use as therapeutic agents for an emergency, but should undoubtedly be used later on.

MR. DEVEREUX MARSHALL thought it unlikely that tapping the detachment where there was a growth would help the diagnosis by the examination of the fluid evacuated, as the tumor would not be broken up by tapping.

MR. JESSOP had found, according to his experience, that, after tapping, the detachment returned or got worse. He had had one case in which the retina had become re-applied after treatment by rest and pilocarpin; great pigmentation followed in the reattached area.

DR. LITTLE had operated a good many times. He had had only two cases in which complete permanent cure was effected; he had seen no recoveries without operation.

MR. SECKER WALKER advocated withdrawal of the fluid, and at the same time injection of normal saline solution into the vitreous. Temporary glaucoma ensued in one case, which

passed off. The retina remained attached five weeks, but subsequently the detachment returned again.

MR. LANG had had two cases of spontaneous cure under simple treatment by rest. He had tried puncture by various methods without success.

MR. TWEEDY had operated by every possible method; he had never seen a permanent cure; he had seen improvement. He questioned the diagnosis in cases of cure. He thought it right to do scleral puncture, however. The most successful case was that of a nurse who was myopic; the vision was reduced to hand movements. After rest and pilocarpin treatment vision was restored to J. I. The improvement lasted some time.

THE PRESIDENT was able to give the further history of this case. He had seen the patient seventeen months later; she was quite well, and there was no sign of detachment.

MR. POWER had seen the suggestion made that an injection of fresh vitreous of a cat or dog should be made into the vitreous to re-apply the retina by pressure.

MR. JOHNSON TAYLOR asked if elaterium had been used as treatment by any of the members.

MR. GRIMSDALE had seen Mr. Frost attempt to inject vitreous, but he had found it impossible to make the vitreous flow through a syringe.

SELECTIONS.

CASE OF MUSCULAR DETACHMENT OF RETINA WITH REATTACHMENT AND RECOVERY.

BY B. L. MILLIKIN, M.D.,

Professor of Ophthalmology, Medical Department of Western Reserve University.

On March 25, 1895. D. A., 80 years of age, a physician who has always been in fairly good health, and who has always used his eyes for as much close work as he pleased, came to my office with the following history:

As long as he could remember his left eye has never been a good one, the vision being somewhat impaired, so that he was unable to read with it alone with any comfort, except by using large type. His right eye had never given him any trouble until the week previous to the time of my examination. He was then in his accustomed fairly good health, and had gone into the country to see a patient. On his way back, walking, he faced a strong, cold wind which produced a good deal of congestion of the face, watering of the eyes, and some irritation. Upon his returning home and undertaking to read, he found himself unable to make out the letters, even of considerable size, everything being in a blur. A week later I saw him, the conditions not having changed so far as he was able to tell during that time.

Upon making an examination I found the following conditions present:

O. D. $V=6/LX$.

O. S. $V=6/XXIV$.

In looking directly at letters with his right eye he was unable to see them, but by looking to one side he was able to make out the largest letters on the test-card. His field of vision was taken and disclosed a marked central scotoma, absolute, in the right eye, with the field otherwise good.

After dilating the pupils with cocain an examination of the eye grounds showed as follows:

O. D. Disc round, good size, choroidal crescent outward, vessels normal in size and distribution, general retinal appearance perfectly good, except in the macular region there was an area perhaps two-thirds the size of the disc in diameter showing undoubted detachment of the retina in that area. It appeared white, with well-marked lines of demarcation, furrowed in appearance, the lower margin being like two or three short fingers of an inflated glove. The detachment seemed to extend from the macula mostly downward. The retina was very appreciably elevated, as there was no red reflex from it, and the lower margin had a distinct appearance of bulging forward.

Loring has aptly described the condition as resembling

the furrows seen on the beach after the receding tide. In this case, however, the furrow is more marked and has very much the appearance of two or three short fingers of a glove when blown up, the constrictions between the fingers answering to the lines of attachment of the retina to the choroïe below. Otherwise I could discover no indication of disease of the fundus, or any indication of retinal disturbance. Examination of the the left eye showed the general fundus in good condition with evidently an old macular choroido-retinitis, with pigmentary deposits in the various portions of the macular and perimacular region, not, however, particularly marked, but undoubtedly sufficient to account for the diminished vision at the present time and his inability to read with the eye for many years. The patient was directed to give up absolutely all efforts at trying to use the eyes for close work, avoid stooping, marked muscular exertion. and to be quiet excepting in so far as light exercise, driving, etc. was permitted.

On April 7th the condition of the eyes showed no appreciable difference with the ophthalmoscope, nor had the vision in any way improved. On May 22d, however, there was marked improvement in the entire condition. At that time the vision of the right eye was $\frac{6}{xxiv}$ (?). The fluid under the retina had entirely disappeared, the retina had become reattached, and there had evidently been no extension of the detachment beyond that seen at the first visit. The condition present was one of choroido-retinitis, with slight pigmentary deposit showing in the former area of detachment.

June 28th the following notes were made: O. O, V= $\frac{6}{xii}$ (?)

The vision had very decidedly improved in sharpness, the central scotoma had disappeared entirely, there was complete attachment of the retina, and in the macula and below were pigment deposits of the choroido-retinitis, which, no doubt, are likely to be permanent. In other words, the appearance of the right eye has very much the appearance of the left ophthalmoscopically, both in the character of the pigmentation and in the area involved.

Examination of the refraction of the eye was made at this

time, and the following correction made and glasses ordered for distant use.

O. D.—0.50 D^s \subset + 1.25 D. cy. ax. 180° V= $\frac{6}{IX}$ (?).

O. S.—0.50 D^s \subset + 1.00 D. cy. ax. 180° V= $\frac{6}{XXIV}$.

This quite materially sharpened the vision for distance. With proper correction glasses he was able to see ordinary type perfectly well, except after looking at it for a few minutes it would disappear. In other words, he was unable to hold the retinal images with this eye, showing that the disturbance has not entirely passed away.

He has been enjoined absolutely from doing close work, until the sensitiveness has quite subsided, as I have no doubt that any over-use or over-congestion might develop a similar attack.

It is a well known fact that detachments of the retina are not infrequent, and that the area involved may be from a very small portion to that of the entire retina; also that the great tendency in small areas is to extend and involve more and more of the retina in the separation. Usually, as the ophthalmologist sees them, the majority of detachments are in the lower portion of the field, but this is undoubtedly because the tendency in all cases is for fluid to settle to the bottom of the eye so that detachments taking place in the upper portions of the field are transferred by the effect of gravity to the lower portion, and retinal detachment disappears in the primary location.

The vast majority of cases of detachment of the retina are found in highly myopic eyes, where the stretching of the walls of the eye-ball separates the retina from the choroidal coat behind it, due probably to fibrillary changes, especially in elderly people. Detachments may occur, however, from any cause which contracts the vitreous body, from either loss of vitreous as in wounds and operations, or any disease of the vitreous which diminishes its bulk. On the other hand, a large class of detachments is due to effusions of fluid from the choroid under the retina, from hæmorrhages, or from new growths taking place. In certain cases, as in the case above detailed, the detachment takes place without any definite known cause, but is perhaps predisposed to it by the fibrillary

changes which not infrequently take place in the eyes of elderly people.

Prognosis of all cases of detachment is essentially grave, as the tendency of all cases is to increase and finally involve the whole or the greater part of the retina. The symptom which the patient experiences is usually some blurring in a portion of the field of vision, and is often described as a cloud before objects in certain positions. Of course this can be appreciated when it is remembered that whenever there is a detachment of the retina complete blindness over that area must exist. Ordinarily there is no pain, and the cloudy appearance usually comes on suddenly. Sometimes light-flashes or scintillations over the area involved prevail. Examination of the fields will at once disclose the total loss of vision in the area involved, as in our case in which there was a marked central blind spot.

I have no doubt, the conditions present in this case were some fibrillary changes in the tissue connecting the retina and choroid, senile in character, and that the immediate cause was the congestion induced by the patient facing a strong, cold wind, which produced much congestion, as indicated by marked tearing from the eyes, secretion from the nose, and the tingling sensation of the skin.

I have myself never before seen a case involving detachment of the macular region alone, so that the condition is one of sufficient interest, taken in conjunction with the recovery, to warrant its publication.

Interesting points in this case might be summed up as follows:

1. The spontaneous detachment of the retina in the macular area, beginning in a heretofore normal and apparently healthy eye, from the congestion produced by a strong, cold wind blowing in the patient's face.
2. The lack of tendency to extend.
3. The somewhat rapid subsidence of the fluid between the retina and choroid, with marked and rapid improvement in vision and practical recovery, without treatment, other than rest of the organ and avoidance of excessive demands upon the circulation.—*West. Reserve Med. Jour.*

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CONTENTS:

ORIGINAL ARTICLES.

On the Practical Execution of Ophthalmic
Prescriptions Involving Prisms.—CHAS.
F. PRENTICE 1

TRANSLATIONS.

On the Hemianopic Reaction of the Pupil.
—DR. S. E. HENSCHEN... .. 7

SOCIETY PROCEEDINGS.

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

Lamellar Cataract and Rickets..... 19
Complete Ankylo-Blepharon..... 21
NEW YORK ACADEMY OF MEDICINE.
Blepharitis..... 23
Reminiscences from a Visit to Several Oph-
thalmological and Otological Clinics of
Europe..... 23

SELECTIONS.

Scopolamine Hydrobromate..... 30

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